

AN ANALYSIS ON
ACQUISITION OF DEFENCE EQUIPMENT IN
PUBLIC PRIVATE PARTNERSHIP MODEL
FOR INDIAN DEFENCE FORCES

by

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ABSTRACT

Over the last six and a half decades, India has built up a sizable defence industry base. Despite being subjected to five wars and proxy conflicts, we as a nation are still spending billions of dollars on arms imports and are yet to create a self-reliant industrial capability and defence systems. In 2010, the Parliamentary Committee on Defence suggested that the Public Private Partnership (PPP) model be implemented in defence industry to increase self-reliance. Foreign policy of a country plays a vital role on the country's route to PPP and self-sufficiency. The fact that defence equipment needs are mostly met by imports, demonstrates that there is a gap between the requirements and indigenous industry's ability to meet these requirements. This indicates that there is a pressing need in India to support PPP in the defence sector.

Consequent to the economic liberalization in 1991, the defence sector was opened up to the private sector in 2001. However, it has failed to attract private companies and most of the PPPs which were finalized for the defence acquisition were the result of offset clause introduced in the Defence Procurement Procedures. GoI has taken a number of steps to address the private enterprises' concerns and as a result, a new dimension in the shape of PPP has been established, which can be a successful model if transparent acquisition system along with well-structured procedures to support PPP is in place. India's military industry is gradually taking on the role of system integrator and manufacturer of comprehensive defence equipment and systems which would result in India becoming self-reliant in Defence systems after the acquisition have been carried out. Of late, there has been an increasing involvement of private sector in the Defence through PPP projects all around the world.

This research study examines the new partnership arrangement between the Government of India and private industry in Defence sector for Acquisition under PPP. Further, this research is primarily an analysis to examine the critical barriers which have inhibited PPPs and to recommend a suitable model so that these barriers can be overcome. Based on the analysis of response received from 66 respondents out of 80, it emerges that most of the respondents support PPP model for acquisition for India to become self-reliant in Defence equipment. The feasibility on acquisition of defence equipment under PPP model is sought to be analysed.

Government of India recently notified the strategic partnership policy to engage the Indian private sector in the manufacture of hi-tech defence equipment in the country. This policy is an integral step towards indigenization, capability development and will lead to PPP. In view of this, it is recommended that the necessary actions like Make-in-India, increasing the indigenous content for items to be procured from abroad, encouraging defence industry, providing level playing field to industries, hand holding of industries etc need to be taken to ensure that India develops the required capacity and capability to become self-reliant in defence acquisition, which would lead to greater strategic autonomy and economic development. Make in India initiative, by GoI, has provided much needed boost to India's defence industry. Government has undertaken several reforms and steps to facilitate 'ease of doing' business. The study recommends that there is a need to loosen Bureaucratic Control, Establish Make in India Council within MoD, need to have Synergy within MoD, need for appointment of an Additional Secretary for the Private Sector within the DDP,G2G Procurements, encourage Strategic partnership model etc.

The Indian private sector has already demonstrated its competence in the fields of automobiles, IT and service sectors at the global level, and the same needs to be replicated in the defence sector. Hence, there is a need to have partnership of the country's public and private defence players which would result in synergising their strengths and also prove mutually beneficial to both in achieving long pending broad objective of self-reliance in the defence sector.

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CERTIFICATE

I have the pleasure to certify that Air Commodore Sanjay Kumar Sharma, has pursued his research work and prepared the present dissertation titled “An analysis on Acquisition of defence equipment in Public private partnership model for Indian Defence Forces” under my guidance and supervision. The dissertation is the result of his own research and to the best of my knowledge, no part of it has earlier comprised any other monograph, dissertation or book. This is being submitted to the Panjab University Chandigarh for the degree of Master of Philosophy in Social Sciences in partial fulfillment of the requirement for the Advance Professional Programme in Public Administration of Indian Institute of Public Administration (IIPA), New Delhi.

I recommend that the dissertation of Air Commodore Sanjay Kumar Sharma, is worthy for the consideration for the award of M. Phil degree by Panjab University, Chandigarh.

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Acronyms

<u>ACRONYM</u>	<u>FULL FORM</u>
ASSOCHAM	Association of Chambers of Commerce
AAP	Annual Acquisition Plan
AoN	Acceptance of Necessity
BEL	Bharat Electronics Limited
BEML	Bharat Earth Movers Limited
CAG	Comptroller and Auditor General
CII	Confederation of Indian Industry
CKD	Completely Knocked Down
DAC	Defence Acquisition Council
DARPA	Defence Advanced Research Projects Agency
DAP	Defence Acquisition Procedures
DCAP	Defence Capital Acquisition Plan
DGQA	Directorate General Of Quality Assurance.
DGAQA	Directorate General Of Aeronautical Quality Assurance.
DPB	Defence Procurement Board
DPM	Defence Procurement Manual
DPP	Defence Procurement Procedure
DPSU	Defence Public Sector Unit
DPR	Detailed Project Report
DRDO	Defence Research and Development Organisation
FDI	Foreign Direct Investment
FF	Fully Formed
FMS	Foreign Military Sales
G2G	Government to Government

<u>ACRONYM</u>	<u>FULL FORM</u>
GoI	Government of India
HAL	Hindustan Aeronautics Limited
HQ IDS	Head Quarters Integrated Defence Staff
IC	Indigenous Content
ICAP	Integrated Capability Development Plan
IGA	Inter Governmental Agreement
IPR	Intellectual Propriety Rights
LTIPP	Long term Integrated Procurement Plan
MoD	Ministry of Defence
MoU	Memorandum of Understanding
MSME	Micro, Small and Medium Enterprises
NCNC	No Cost No Commitment
OEM	Original Equipment Manufacturer
OF	Ordnance Factory.
OFB	Ordnance Factory Board.
PAC	Public Accounts Committee
PPP	Public Private Partnership
QR	Qualitative Requirement
RFP	Request For Proposal
RFI	Request For Information
R&D	Research and Development.
SCAP	Services Capital Acquisition Plan
SIPRI	Stockholm International Peace Research Institute
SP	Strategic Partner
SQR	Service Qualitative Requirements
TEC	Technical Evaluation Committee
TM	Technical Manager
ToT	Transfer of Technology

Chapter I: INTRODUCTION

1.1 Background

India is oftenly referred to as rapidly rising global power, with economic growth consistently above 6% over the last decade (barring the Covid-19 period). Over the last six and a half decades, India has built up a sizable defence industry base. There are almost 50 research labs, 41 Ordnance factories (which have lately been converted to seven corporations) and nine DPSUs. These organisations are responsible for the design, development, and manufacturing of all equipment, munitions and armaments to meet the military's future needs. However, they have only been able to offer a limited number of cutting-edge weaponry and ammunition, resulting in an over-reliance on imports. Despite being subjected to five wars and proxy conflicts, we as a nation are still spending billions of dollars on arms imports and yet to create a self-reliant industrial capability for defence systems.

The Indian private sector's capabilities and potential in delivering defence equipment have not been completely explored, because state-owned DPSUs and global-defence suppliers continue to dominate. For the development of a vibrant military industrial base in the country, the government is continuing to modernise and strengthen the defence procurement process through offsets, Transfer of Technology (ToT), Foreign Direct Investment (FDI) and Public Private Partnership (PPP). The Defence Procurement Procedure in accordance with the Government's various policies has been continuously reformed to conform to the objectives of modernization of the Armed Forces within reasonable timeframes while maintaining the highest standards of transparency, probity, and public accountability. Necessary impetus is also being given by Govt in form of initiatives like Make-in-India and AtmaNirbhar Bharat

The Armed Forces' modernisation plans have been stymied by quandary of whether to spend the money on modernization or infrastructure development or other programmes that directly affect the well-being of its personnel. The next step after acquisition of equipment is indigenous manufacturing which occupies critical position as an engine of economic growth. Governments around the world are looking to private sector to augment and take on this aspect through PPP.

1.2 Present Scenario

1.2.1 In 2010, the Parliamentary Committee on Defence suggested that the PPP Model be implemented in defence industry to increase self-reliance. Even if India needs to import guns and systems, the majority of its requirements need to be met by indigenous sources. Trade policy of a country plays a vital role in the country's objective of attaining self-sufficiency.

1.2.2 The private sector can obtain cutting-edge technology, best managerial methods with minimal bureaucratic red tape, outstanding marketing skills and effective financial management strategies. On the other hand, the public sector possesses outstanding infrastructure, manufacturing facilities, and a highly skilled workforce. As a result, a well-balanced fusion of public and private sector would result in a mutually beneficial synergy of strengths, with economies of scale as a backdrop. The fact that defence equipment needs are presently covered by imports demonstrates that there is a gap between requirements and indigenous industry's ability to fulfill them. To bridge this ever

widening gap, PPP Models are the only possible way ahead, alongside simplified Government policies. PPP is a system in which a private party not only participates in the design, financing, construction, or reconstruction of an infrastructure facility, but also in its subsequent operations, service provision, and technical maintenance.

1.2.3 PPP is regarded as a new governance tool for improving efficiency in the supply of public goods and services. As a result, PPPs do not imply shrinking or even rationalising the government, rather, they entail a shift in the government's role from direct supply of public goods and services to indirect techniques that enable and coordinate the provision of public services.

1.3 Definition

(GoI, MoF Dept of Economic Affairs, 2016) The *PPP Guide for Practitioners* issued by Department of Economic Affairs of the Ministry of Finance states ¹:-

“A PPP means an arrangement between Government or statutory entity or Government owned entity on one side and a private sector entity on the other, for the provision of public assets and/or related services for public benefit, through investments being made by and/or management undertaken by the private sector entity for a specified period of time, where there is a substantial risk sharing with the private sector and the private sector receives performance linked payments that conform (or are benchmarked) to specified, pre-determined and measurable performance standards”

In simpler words, a PPP is a contract between the Govt and a private entity (also known as the provider) to provide services to residents on behalf of the Govt, which must be delivered within a certain time period, budget, quantity, and quality. The ultimate ownership of assets involved or created remains with the public sector, though operation and maintenance of assets, as well as related service delivery responsibilities, are with private sector during the interim period until contract expires. A service provider might be a single private company or a group of private companies called a "consortium." In PPP, accountability for delivery of public service is retained by public sector, whereas under privatisation, accountability would move across to private sector.

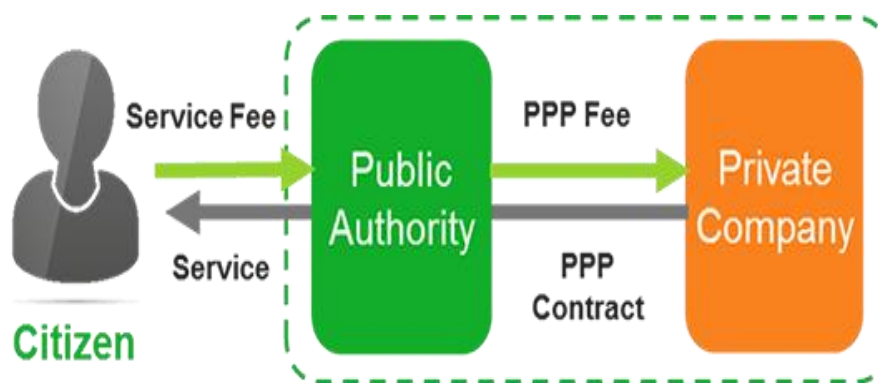


Figure 1 PPP model at a glance

(Source: <https://www.thalesgroup.com/en/markets/digital-identity-and-security/government/identity/public-private-partnerships>)

Public authority pays for the service. Public authority keeps the public service mission. A private company acts as a supplier to the public authority

1.4 Need for PPP

PPPs offer a number of advantages which includes the ability to attract private capital, complete a greater number of infrastructure projects, introduction of private-sector experience and cost-cutting technologies. All of these lead to increased

efficiencies in operations and maintenance. Apart from the financial ramifications, PPPs are tools for governments to meet their fundamental commitments to create higher infrastructure services by raising private sector's accountability as a service provider. Need for PPPs ⁱⁱ (Singh, 2017) are discussed under following heads:-



Figure 2 Need for PPP

Source : (Singh, 2017) <http://www.onlinejournal.in>

1.4.1 Better infrastructure It is a fact that most governments face the problem that public financing is not enough to bridge the gap between infrastructure needs and available funds. Accordingly, infrastructure development has to rely on private markets to leverage and mobilise capital. Better infrastructure would be a boost for investment of funds.

1.4.2 Risk sharing The private sector is considered to be more proficient in resource acquisition and delivery of utilities than government. Due to this the related risks are transferred to private sector.

1.4.3 Optimum allocation of resources PPPs can help in the optimum allocation of public resources for the development of infrastructure. PPPs

concentrate on delivering cost effectiveness over the duration of asset including those costs which are associated with operation and ongoing maintenance.

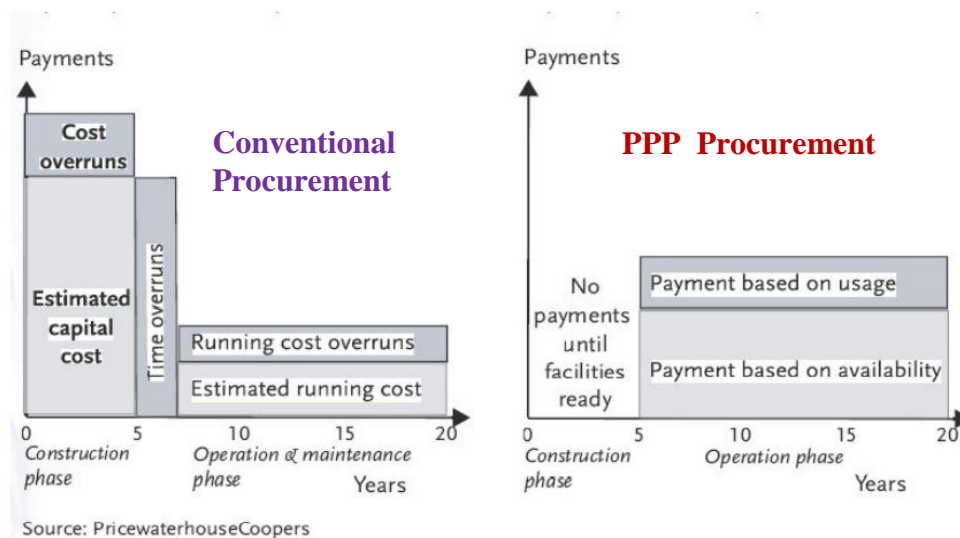


Figure 3 Conventional versus PPP procurement

Source : PricewaterhouseCoopers

1.4.4 Value for Money Value for money is the ideal blend of entire life cycle costs, risks, finishing time and quality with a specific end goal to meet the slated prerequisites.

1.4.5 Innovations Development is another imperative idea that the private segment can convey to public utilities. The private sector is constantly hunting down new ideas to expand their aggressive edge and to save costs.

1.4.6 Aid in growth of other sectors For government, PPP frees up fiscal funds which can be utilized for other areas of public service and improves cash flow management. Consequently, public funding required for public services can be reduced and redirected to support sectors of other higher priority, e.g., education, healthcare, community services, etc.

1.4.7 Catalyst for the economy For private sector, PPP provides access to public sector markets. If priced accurately and costs managed effectively, projects can provide reasonable profits and investment returns on a long-term basis.

1.4.8 Improves image of country There will be more development of better physical infrastructure and services through PPP and it will create a good impact on tourism and other sectors for economic development.

1.4.9 Increase in GDP Infrastructure development and better services through PPP will lead to multiplier effect for economy and hence development of all sectors which will add up to the Gross Domestic Product.

1.4.10 Attract FDI Scope for investment by private sector in infrastructure will also provide the opportunities to foreign investors to participate thereby reducing the financial crunch.

1.5 Key Benefits of PPP Model

Facing constraints on public resources and fiscal, while recognizing the importance of investment in infrastructure so as to help economies grow, Govt are increasingly turning to the private sector for funding. While recent attention has been focused on fiscal risk, Govt looks to the private sector for other reasons and main benefits for Govt are ⁱⁱⁱ (*Government Objectives: Benefits and Risks of PPPs, 2020*):-

1.5.1 Improves public service efficiency Partnering with technological expert accelerates the modernisation of public administration. It will free up resources which can be allocated to other vital services for citizens.

1.5.2 Budget Management Constraints on availability of budget and risk involved in investment are eliminated. No upfront investment is demanded of Govt., instead this is shouldered by private investors.

1.5.3 Risk Management The private company takes on the majority of the risks i.e. implementation and Operational risks.

1.5.4 Broader Economic Development Private company makes a significant investment in country's infrastructure, manages it through a long term agreement by supplying its technology, providing experts to set it up, employs and trains local workforce. In the process, these local employees acquire a high level of skills that can subsequently be used to benefit other sectors. The private company will also use local partners for implementation, operation, creating another channel for the diffusion of technology within the country, increasing diversification of the local economy, developing other businesses, making additional investments, and, ultimately, participating in and contributing to the country's overall growth.

1.5.5 Additional Benefits Few other benefits like Speedy, efficient and cost effective delivery of projects, value addition through synergies between public and private sector, competition, accountability for timely delivery of services and effective utilization of state assets to the benefit of all users of public services etc.

1.6 Major Limitations of PPP

Like the flip side of the coin, PPP has its own limitations too. Major limitations of PPP are:-

- (a) PPP contracts are much more complicated than conventional procurement contracts, as the parties involved need to anticipate all possible contingencies that could arise in such long-term contractual relationships.
- (b) Financial outcomes are very difficult to estimate over such long periods. There is a risk that the private sector may either go bankrupt, or make very large profits. Both outcomes can create political problems for the government, causing it to intervene. This is more so in the case of defence contracts.
- (c) Given the length of relationships created by PPPs and difficulty in anticipating all contingencies, it is not unusual for aspects of the contracts to be renegotiated at some stage.
- (d) Few other limitations are complex procurement process with associated high transaction costs and long lead time for structuring and procurement under PPP.

1.7 Justification of the Study

A nation's military strength is predominantly guided by its economic might. There always exists an element of insecurity as to whether the supply of arms will be stopped at the behest of foreign supplier's Government.

In modern warfare systems, self-reliance is crucial. When we acquire weapon systems from other countries these are created and produced by a third-party company. The algorithms and technology used in the system are classified, and even after the purchase, the vendors refuse to share the technology or process used in the system's development. As a result, laying down the system's maintenance /

upgradation within the life cycle, which could last anywhere from 20 to 30 years, is challenging. This is basically due to lack of knowhow of the weapon system and critical integration issues. To overcome this, self reliance and indigenous manufacture of these systems is the only answer.

In this context, it is critical to investigate the importance of foreign direct investment in the defence sector, which is currently is 74% of total investment. The government is pursuing a number of projects aimed at boosting the national economy, with 'Make in India' and Atmanirbhar Bharat being the most significant. As a result, it would be my endeavor to bring out various issues and facts related to acquisition of defence equipment.

1.8 **Statement of Problem**

(a) To some extent, Indian industry has been producing defence items, but with reservations, as there are problems in creating defence products, which are highly technology driven and capital expensive. Frequently changing QRs, specific utilisation of items (since they can't be used in civil), requirement for limited and unpredictable quantity involves a lot of financial risks and cannot guarantee timely return on investment for private companies. These are just few of the factors that are cause of concern for private players. When balanced against the limited Defense market, these factors deter profit-driven enterprises from entering the field of defence manufacturing.

(b) GoI has taken a number of steps to alleviate private enterprises' concerns which have been referred above. A new dimension in the shape of PPP has also been established, which can be a successful model if a transparent acquisition system along with well-structured procedures are set

in place to support PPP. This would ensure that cutting-edge technology is transferred within the country for military hardware manufacture, rather than relying on foreign suppliers.

(c) In the past there have been ToT between DRDO, other R&D Govt organizations with academic institutions to manufacture the products which would be procured by Defence Forces. Further, lot of MSMEs have also ventured into the field of producing defence equipment / items. Indian enterprises are expanding not only within India, but also internationally, and many are becoming global corporations. On the private sector front, India's military industry is gradually taking on the role of system integrator and manufacturer of comprehensive defence equipment and systems.

(d) Post liberalization of the economy in 1991 various policies were initiated in favor of attracting public private participation but these have met with varying degrees of success. Though the defence industry was opened up to private sector in 2001, it has not met with the success as the other sectors like infrastructure or for that matter roads, ports, telecommunication sectors which have been successful in adopting PPP.

(e) The present research work has been motivated by increasing private sector involvement in the Defence through PPP projects all around the world. This research study looks at the PPP structure between the government and private sector in acquisition of defence equipment for the Defense forces.

1.9 Rationale of the Study

For any country to be self-sufficient in the defence industry, substantial R&D is required for expansion of its military might, and India is no exception. Many countries, on the other hand, prefer the public sector to the private sector. This results in the private sector being denied necessary opportunity to expand their business. Furthermore, the majority of worldwide Defense equipment providers are only system integrators who create goods according to the specifications against a certain order. These businesses may close their doors, resulting in a lack of maintenance and product support throughout the equipment's life cycle. This is exacerbated in the case of crucial imported components.

As the indigenous manufacturing capabilities are not well developed, it becomes difficult to repair or upgrade equipment to keep pace with development in technology. Thus there is a need to have vibrant Defence industry within the country to produce state-of-the-art Defence equipment and carry out R&D in house for continuous up-gradation of technology. Despite the fact that the government has opened up PPP to 100 percent, this is yet to blossom. Therefore, it would be an endeavor to bring out the various issues and facets on acquisitions under PPP and its likely effect on Defence Sector.

1.10 Significance of the Study

This study would help in identification of the most critical barriers, the mitigation of which would enable robust and effective PPP in Indian defence industry. This would enable the government in achieving its aim of attaining 70% self-sufficiency.

1.11 Organisation of the Study

(a) **Chapter II** gives literature review and details of research methodology which was carried out to find the outcome to the research questions.

(b) **Chapter III** on 'Defence Equipment Production in India' gives a brief on Defence acquisitions, dilemmas facing Indian Defence Acquisition, Barriers to PPP in defence sector, present acquisition policies / procedures and harnessing PPP with an overview of present state of Defence equipment acquisition in India. The status of various countries which have adopted PPP model for acquisition along with the current status on adoption of PPP for acquisition by our country will be elaborated. It will also cover in brief the profile of major Defence equipment manufacturers.

(c) **Chapter IV** on 'Challenges and Advantages of Defence Production in Private Sector' brings out the anomalies in the present process of acquisition of defence equipment and the steps to be taken to overcome the same with an aim to enhance PPP in defence. The spectacular growth that the country has witnessed in the recent years has largely been driven by private sector. There are number of advantages and disadvantages that private sector can offer in the matters of manufacturing / production after the acquisition of defence equipment. However, the reliance on private participation is not without associated challenges. Make-in-India initiative has also contributed and given flip to the private sector. This chapter deals with these aspects.

(d) **Chapter V** of the study summarises the Conclusions.

(e) **Chapter VI** Finally presents recommendations.

Chapter II: RESEARCH METHODOLOGY & LITERATURE REVIEW

Defence industry is highly technology driven and capital intensive. The defence sector was opened to private sector in 2001. Most of the PPPs which were finalized for the defence acquisition were the result of offset clause introduced in the DPP. Since it may take time for domestic companies to acquire a technical edge, it is important to consider the vital question of assessing the technology through the PPP including FDI to set up production bases / facilities within the country together with R&D. This would facilitate transfer-in of state-of-the-art technology for production of military hardware in the country itself rather than relying on imports. This study primarily undertakes an analysis to examine the critical barriers inhibiting PPPs in the acquisition of defence equipment.

2.1 Objectives of the Study

With the existing global security environment, a question that perennially lingers in the mind is whether the nation can meet the onerous challenges with a capability built on an overwhelming 70% of imported hardware?. Would that not make the country vulnerable to external forces in a crunch situation and also be without a ‘surprise’ element to enemies? We are still dependent on imports for critical weapons & equipment while participation of our private sector in defence production is negligible. There is a wide consensus amongst the intelligentsia that the only way forward for India is the route of self-reliance. But to chart that route, one needs to clear the cobwebs in mind and embrace the need for active PPP in the defence sector.

It will be an endeavor to analyse the feasibility on acquisition of defence equipment under PPP model considering the existing Govt policies and to suggest any changes,

with the overall aim to attain effectiveness /edge without compromising on defence preparedness. The main objectives of the study are:-

- (a) To analyse relevance of PPP in acquisition of Defence Equipment for Indian Defence Sector along with challenges and advantages of defence production by private sector.
- (b) To study the progress and benefits of PPP in acquisition of Defence Equipment.
- (c) To evaluate the critical barriers to PPP implementation in acquisition of Defence Equipment in India.
- (d) To analyze the impact of various policies like Offset Policy, Make in India, Atmanirbhar Bharat, Ease of Doing Business, initiatives on Defence sector.
- (e) To analyse the perception of Government on the effectiveness of PPP and FDI in defence sector.

2.2 **Research Objectives**

The main objectives are:-

- (a) To examine the existing system of procurement of Defence Equipment and identify lacunae, if any, in its effectiveness.
- (b) To examine the feasibility of acquisition of Defence equipment under PPP model.
- (c) To suggest a suitable model of PPP for an efficient and effective tool in Defence acquisitions.

2.3 **Research Questions**

Following are the research questions:-

- (a) What are various components of PPP for its effective management of acquisitions in Indian Defence Sector?
- (b) What are salient features of cases that have fructified under PPP model in the Indian Defence Sector during the period from 2014 to 2019?
- (c) To what extent the Govt policies on PPP, contribute in realizing the objectives of self reliance in Indian Defence sector?

2.4 **Research Strategy and Research Design**

The research strategy adopted for the study is the mix of qualitative and quantitative. The research design is Descriptive and exploratory. Defence procurement procedure and various government regulations impinging on the defence sector with special reference to acquisition under PPP has been analysed to identify the critical barriers. The resources available in the open domain have been used for the research. The responses to the questionnaire will be used to quantify the problem.

2.5 **Research Methods and Data Sources**

Primary data collected through structured questionnaire will be canvassed to officers from Defence services/ DPSUs/IAS & Allied services. The sample size will be 66 since these many responses were received and the sampling technique will be purposive. In-addition, Secondary data available on websites, journal, books and Reports of Government will be analysed. The literature reviews that explore concepts

and theories will also be utilised. Over and above, relevant data from open sources will be supplementing the analysis of this research work.

2.6 Data Collection Methodology

- (a) Primary The instrument for collecting primary data has been structured Questionnaire in Google forms.
- (b) Secondary These sources include research papers, reports, professional articles, newspapers and data available on the web based sources.

Expected Results

The assessment and analysis of the primary data i.e questionnaire, secondary data, literature review; journals and books, on defence sector, has been used for undertaking analysis and making recommendations.

2.7 Scope / Limitations

The scope of study is limited to Indian Defence sector:-

- (a) This research limits itself to Indian Defence sector with PPP as mode of acquisition. However, an attempt will be also made to explore the possible implications of FDI in Defence equipment manufacturing which would effect PPP.
- (b) The subject matter pertains to Defence sector, therefore, the restriction of access to data will be a constraint. Only unclassified data and information available on open forums will be used.

2.8 Literature Review

A detailed literature review was carried out to identify, evaluate and interpret the work produced by researchers and scholars on the subject matter of the research problem and thereafter the research gaps were identified. The knowledge gained through extensive reading has helped me tremendously in carrying out my research in a very objective and methodical manner. The details of the literature survey carried out are enumerated in succeeding paras.

Kaur,K. (2013). in her article ‘**PPP Model in Defence Beset with Hurdles**’ brings out various facets of Defence Industrial base in India and the role of PPP in making India self-reliant. The author has brought out that in India, PPP model has worked well in building large and complex infrastructure projects like roads highways, airports etc. The researcher opines that same approach can be adapted for Defence industry by amalgamating private Industries by providing them right impetus.

Kaushal, Vinay. (2014) in his article ‘**The Imperative of Public Private Partnership in the Defence Aviation Industry**’ published on www.idsa.in had suggested that there exists a need for taking strategy based decisions instead of project based decisions, preparing a long term plan for technology acquisition and to harness PPP which will be the way forward. Further, it has been recommended that with long term strategy, OEM can scout for competent Indian entities to acquire requisite expertise and build partnership with Indian Industries. One of the aims of a well-designed PPP is to find out and pick up the strengths of each sector and combine them. This results in a partnership of both public and private authorities,

who can together deliver more than what they can do individually. The author has opined that there exists right kind of eco system in India for PPP.

Paneerselvam,P. (2016) in his article **‘Restructuring Indian Defence Industry : Enhancing the Role of the Private Sector’** has brought out monopoly and inability of DPSUs to attain self sufficiency even from Licenced production. It has been recommended to enhance the role of Private sector and also Public sector to act as catalyst in developing the Private sector.

Kaushik, Chandrika. (2017) in her Research paper **‘PPP for MRO in Defence Application to Aerospace and Land Systems’** has examined various aspects related to employing PPP model in Maintenance Repair and Overhaul (MRO) activities for Aerospace and land forces in India. The author has suggested to leverage the potential of private sector while retaining the complete control with Govt which would increase the uptime of the existing equipment and enable its better utilization during the life cycle management.

Kumar, Samir and Modi, SN. (2017) in their Research paper **‘FDI and PPP in Indian Defence Sector (A Perception Based Analysis)’** has brought out the initiatives taken by Govt with regard to Defence sector in easing FDI norms, enhancing PPP limits and amending Defence procurement procedures to stride the wave of globalization and liberalization. The paper brings out the SWOT analysis on factors which influences FDI and PPP in Defence sector.

Grover,Megha and Khattar, Kapil. (2019) in their Research paper **‘A PEST Analysis on the Impact of Make in India Program on manufacturing sector’s productivity’** has brought out Make in India initiatives which will have an

impact on Defence Manufacturing sectors. Further, the paper brings out effects of Political, Economic, Social and Technological (PEST) factors on Make in India program on manufacturing sector.

Chander, Sushil. (2019) in his article '**Public Private Partnership and the Road to Self-Reliance in Defence : A Perspective**' published in Centre for Land And Warfare Studies (CLAWS) www.claws.in has brought out the potential of the new DPP. The author has expressed appreciation for the Government efforts to make the system more transparent and streamlined. The author has suggested various measures to attract private entities into Defence sector which would be beginning of the road for PPP.

Dr Vijay Kelkar Committee Report (April 2005) identified the potential of private sector and the positive opportunities and possibilities that could happen if PPP model is implemented in Defence Sector. The Paper concludes that significant factors like fair play for competitors, Public Private Partnerships, foreign Joint Ventures can enhance Defence manufacturing. Keeping in view the sensitivities of defence sector, it is a challenge to select a suitable and capable private partner. Relevant extracts have been studied.

Defence Procurement Manual (DPM) 2009, Govt of India, New Delhi. This official document outlines the procedure to be followed for Revenue procurements in MoD. This document covers procedure to support those projects which have been procured earlier by the Capital Expenditure route and have now to be sustained during their life cycle in terms of spares, aggregates and accessories.

‘Defence Procurement Procedure (DPP) 2013’, Govt of India, New Delhi.

This official document by GoI, MoD was released in 2013 and outlines Capital Procurement Procedure of various types of projects.

Dhirendra Singh Committee (2015) in their report on 'Facilitating Make in India in Defence sector through Defence Procurement Procedure' have recommended a conceptual ladder for 'Make in India' in Defence sector of India.

Laxman Kumar Behara and Gp Capt (retd) Vinay Kaushal, **‘Defence Acquisition – International best practices’**, Pentagon Press, 2013. This book in terms of Defence Procurements gives the details of various models followed by some of the advanced countries.

Laxman Kumar Behra, A Case for Increasing FDI up to 100 per cent in India’s Defence Industry, Paper published in Institute of Defence Studies and Analyses, 30 Dec 2010.’

Indigenisation of Defence Production — Public Private Partnership 33rd Report of Standing Committee of Defence (2008-2009),

Public Private Partnership 5th Report of Standing Committee of Defence (2009-2010),

Defence Procurement Procedure 2013 — A Ringside View by Amit Cowshish an IDSA Issue 11 June 2013

Indian Defence Industry — Issues of Self Reliance by Laxman Kumar Behera an IDSA Monograph Series No 21 of July 2013,

Essential Characteristics of DPP 2013 published by Acquisition Wing MoD, GoI MoF DoEA PPP in India material on website <http://www.pppinindia.com>,

Defence Acquisitions and Offsets :The Road Ahead by Karanpreet Kaur,

Private Sector in Defence Production and The Communication Gap in Defence Procurement by Maj Gen Mrinal Suman (Retd),

2.9 **Analysis of Literature Review : Research Gaps**

After going through the literature review the following research gaps have been identified:-

- (a) Steps / methods and road map for applicability of PPP to Indian Defence Sector.
- (b) Measures to be taken for enhancing role of private industry and building partnership with Private Sector.
- (c) Factors of Make-in-India which should be dwelled upon to improve its implementation wrt Manufacturing in Defence Sector.

2.10 **Limitations of Study**

After going through various articles, reports and dissertations available in Shodhganga and in the library of Indian Institute of Public Administration, it is found that very limited studies have been done earlier on the subject of acquisitions based on PPP in Indian Defence Sector. The limitations of the study are as follows:-

- (a) On an online search, it was found that there is no detailed research work carried on PPP in Defence Sector in Indian context. The topic is contemporary therefore no detailed thesis is available about it. This is one of the major limitation researcher had to face.

(b) Access to Data. The subject matter is of defence sector, therefore, the restriction on access to data exists. Only unclassified data and information available on open forums can be used.

The chapter has covered all the details about the procedure of research methodology of this study, explained the methods of data collection, research design, instrument and the statistical tools which will be used. The study would help in identification of the most critical barriers, the mitigation of which would enable robust and effective PPP in Indian defence industry. The various results and findings will help in analysis of data and for recommending suitable solution to the problem under research.

Chapter III : PRODUCTION OF DEFENCE EQUIPMENT IN INDIA

3.1 Acquisition Objectives

Acquisition of defence related equipment can be defined in a nutshell as a delicate and complex process which requires the following objectives to be fulfilled:-

- (a) The existing equipment being obsolete would need replacement.
- (b) The new equipment will be an addition to the arsenal of the armed forces inventory, which would enhance the combat potential of that particular arm of service.
- (c) The equipment being bought must meet all the Services Qualitative Requirements (SQRs).
- (d) The contract or the deal must be executed with adequate transparency.

3.2 Types of Acquisition in Defence

Defence procurements are divided into two categories: 'Capital procurements,' which involve the purchase of tangible assets of a permanent nature and 'Revenue procurements,' which involve the purchase of items, spares etc so as to maintain already held assets in the service. Following the recommendations of the Public Account Committee (PAC), the DPP was formulated, which mostly dealt with capital procurements, and to deal with the revenue procurements Defence Procurement Manual (DPM) was then issued.

To ensure that above objectives of the Capital Procurement are met, MoD has formulated Defence Procurement Procedure (DPP) and published it on its web site. The last DPP was issued in 2106 and the same has been revised, rechristened as Defence Acquisition Procedure (DAP) 2020. It is available to all prospective vendors

the world over. Capital Acquisition as per Defence Acquisition Procedure (DAP) 2020 (MoD, 2020) has following categories ^{iv}:-

3.2.1 Buy (Indian-IDDM). The 'Buy (Indian-IDDM)' category refers to the purchase of goods from an Indian vendor that are indigenously designed, created, and manufactured with at least 50% Indigenous Content (IC) on a cost basis of the base contract price, i.e. total contract price less taxes and duties.

3.2.2 Buy (Indian). The 'Buy (Indian)' group applies to the purchase of goods from an Indian vendor that were not designed and manufactured in India and have a 60 percent IC on the cost basis of the base contract price. Vendors who qualify for the 'Buy (Indian-IDDM)' category will be allowed to participate in this category if they have an indigenous concept and a minimum of 50% IC on a cost basis of the base contract price.

3.2.3 Buy and Make (Indian). The 'Buy & Make (Indian)' category refers to an initial purchase of equipment in Fully Formed (FF) state in quantities deemed necessary from Indian vendor(s) in a tie-up with a foreign Original Equipment Manufacturer (OEM), followed by indigenous production in a phased manner involving Transfer of Technology (ToT) of critical technologies as per specified range, depth, and scope from a foreign Original Equipment Manufacturer (OEM). A minimum of 50% IC on the cost basis of the Make portion of the contract, less taxes and duties, is expected under this category of acquisition. This category of acquisition can also be carried out without the need for any initial equipment procurement in the FF state.

3.2.4 Buy (Global - Manufacture in India). Buy (Global - Manufacture in

India) refers to an outright purchase of equipment from foreign vendors in quantities deemed necessary, followed by indigenous manufacture of the entire/part of the equipment, spares/assemblies/sub-assemblies/Maintenance, and Repair and Overhaul (MRO) facility (only in cases where these are part of the main contract). Vendors from India will be allowed to participate in Buy (Global - Manufacture in India).

3.2.5 Buy (Global). 'Buy (Global)' category refers to outright purchase of equipment from foreign or Indian vendors. In case of procurement through foreign vendors, Government to Government (G2G) route/Inter Government Agreement (IGA) may also be adopted, for equipment meeting strategic/long term requirements. An Indian Vendor participating in this category would be required to meet minimum 30% IC, failing which such vendor would be required to discharge offsets as applicable in the case. Foreign vendors will need to discharge offsets in all Buy (Global) cases with Acceptance of Necessity (AoN) cost of Rs 2000 crores or more, other than all ab-initio single vendor cases, including procurements based on IGA/FMS.

3.2.6 Leasing. Leasing has been introduced as another category for acquisition in addition to the existing 'Buy' and 'Make' acquisition categories as it provides for an innovative technique for financing of equipment/platforms. Leasing would be permitted in two sub categories i.e. Lease (Indian), where Lessor is an Indian entity and is the owner of the asset, and Lease (Global).

3.3 Existing Set up of Indian Defence Procurement

It comprises of the following:-



Figure 4 Org Chart Defence Acquisition Council
Source: MoD

3.3.1 Defence Acquisition Council (DAC). It is the apex level of Defence Procurement Process and is headed by the Hon'ble Raksha Manthri (RM). It is the body which sanctions and accords Acceptance of Necessity (AoN) for all capital acquisition projects. The implementation of the procurement process as approved by the DAC rests on the DPB, the Defence Procurement Board and Defence R&D Board.

3.3.2 Defence Procurement Board (DPB). DPB has the responsibility on capital procurement related to 'Buy' and 'Buy & Make' decisions of the DAC. Defence Secretary is the Chairman of the DPB. It plays a key role in coordinating and monitoring of the procurement process undertaken by the Acquisition Wing of the MoD for the ibid categories. It is responsible for the approval of the Annual Acquisition Plan (AAP) of the three services. It accords approval for such projects which need sanction beyond the laid down powers of the RM and therefore would require the

approval of the Cabinet Committee on Security (CCS) / MoD and/or Ministry of Finance (MoF).

3.3.3 Defence Production Board (DPrB). Defence Production Board has the responsibility of overseeing indigenous production and performs within the guidelines set by the DAC. Here the project is clearly identified in 'Make' and 'Buy & Make' categories. In its ambit the DPrB is required to closely monitor the progress of all 'Make' projects and update the DAC on the issues related to licence production, ToT and new R&D projects. While its key functionaries are similar to the DPB, it has additional members such as Chairman Ordnance Factory Board (OFB) and MDs of DPSUs.

3.3.4 Defence R&D Board. The Defence R&D Board has been constituted essentially to monitor and report on indigenous R&D proposals flowing out of the 'Buy & Make' and 'Make' decisions of the DAC. It works in close conjunction with the DPB. It ensures that ToT from the laboratory to the industry is done correctly. Scientific Advisor (SA) to RM is the Chairman of this Board with some distinguished scientists are also included.

3.3.5 Defence Acquisition Wing. The Defence Acquisition Wing provides the necessary and vital inputs to the DPB. It is headed by an officer of the rank of Special Secretary/ Additional Secretary. Its office has Financial Advisor (Acquisition), Acquisition Managers and Technical Managers for the three services which are defined as Land Systems, Air Systems and Maritime systems. Acquisition Managers are of the rank of Joint Secretaries.

3.3.6 HQ IDS It prepares the Long Term and the short term

perspective plans for the three services in accordance with erstwhile DPP 2016. The Long Term Integrated Perspective Plan (LTIPP) covers the projects for fifteen years. From this plan, flows the Services Capital Acquisition Plan (SCAP) and thereon the individual services define the Annual Acquisition Plan (AAP). These plans have now been changed to 10 years plan (ICAP), five years plan (SCAP) and two years plan (AAP).

It is well known fact that the Defence acquisition is a complex process which involves multiple stakeholders with expertise in threat scenarios, military affairs, technology, operational requirements, national policies, industry capability, financial management, contract and project management. Despite significant improvements in defence procurement procedures, the goal of increased self-reliance in defence acquisitions and the establishment of a level playing field for the Indian defence industry remains a long way off. Unlike other acquisitions, Defence acquisitions have lot of constraints due to the following factors governing its acquisition:-

- (a) They are technology intensive.
- (b) For most avionics systems, radar systems, fire control systems, and navigation attack systems, cutting-edge technologies like nanotechnology, composite technology, microprocessor technology and radar technology are required.
- (c) The majority of these modern technology are only available in industrialised countries, and India has a long way to go in this area. The country that own this technology are hesitant to share it, defence procurement inevitably leads to reliance on a single corporation or industry of that friendly country. However, at certain times embargoes are imposed by governments

of foreign nations, prohibiting the transfer of such technology to other country.

(d) The majority of equipment employed is along the Indian border, where it is exposed to the extreme vagaries of weather, topography, and other factors. As a result, the necessity for tough and dependable systems with appropriate spare and test equipment support is a must. This condition requires severe quality control which are to be met.

(e) While there is a need to be transparent during procurement, but most of defence equipment specifications are classified and secret on the other hand. Thus there is duality with transparency and secrecy packaged together.

(f) The majority of the equipment in this industry is too expensive. As a result, appropriate budgetary expenditures are required to ensure that the greatest and highest-quality equipment is bought.

(g) Budgetary allocation in the R&D sector is also required so as to provide the necessary push for indigenization of equipment.

(h) All such procurements must be open to public review, and all transactions must be transparent and impartial.

Difference between “Defence Acquisition” and “Defence Procurement”^v

The document DPP lays down the procedures for "defence procurement," however it does not cover all aspects of "defence acquisition" in a comprehensive way (Pahlada, 2013). Further, "defence acquisition" encompasses far more than "defence procurement." "Procurement" is concerned with obtaining a specific system

or piece of equipment for operational use, whereas "acquisition" is concerned with obtaining the system / equipment as well as the capacity to carry out product enhancement, design and development for futuristic items. Thus, "acquisition" aspires for "self-reliance" in practical terms, but "procurement" just "meets an emergent need," with the OEM's continued dependence. Accordingly, DPP which has been recently revised has been rightly rechristened as DAP 2020. Thus, for defence industry, it is "acquisition" which is required rather than "procurement" with total participation of R&D and manufacturing entities leading to "SMART" Acquisition. SMART here is used as an acronym to provide a more comprehensive definition for goal-setting:-

S - Specific so as to meet existing and future operational requirements

M - Meaningful so as to get maximum from Acquisition

A - Acceptable by all Users

R - Realistic formulation of QRs

T - Time-bound deliveries to be ensured

To sum up, it is Self-Reliance through SMART Acquisition. However there is a need to look at the acquisition from perspective of various stake holders^{vi}. The same is as under (Pahlada, 2013):-

(a) **Users' Perceptions.** In general, users demand immediate results and expect acquisition procedures to go quickly. They do not want to wait for indigenously built systems, which takes longer to develop and require extensive testing. To speed up the modernisation process, the majority of users believe that most complicated weapon systems and platforms must be imported. The following are included in the user's framework:-

- (i) Quality should be of World class.
- (ii) Time Frame should be as per their operational requirement and modernisation needs.
- (iii) Cost should be competitive as compared to global market.
- (iv) Quantity required can not be forecasted for their long term requirement. However production capacity limitation or item not available later-on is not acceptable.

(b) **Perspectives of Manufacturing Industry.** To keep their production lines running efficiently, the industry is often focused on profits, risk-free business, large volume orders, annual maintenance contracts and regular repeat purchases. The public sector avoids open competition with the private sector and expects government protection. This protective strategy may be justified in many cases due to technical skill, available infrastructure, under-utilised installed capacity and the security-sensitive nature of systems. However, if the production agency is nominated for even those products for which the private sector is capable of producing, it works as a deterrent to the private sector. Unless there are substantial volume contracts, private sector is hesitant to invest in infrastructure and production capacity specially for the defence equipment.

(c) **Perspectives of R&D Organisations.** According to R&D organisations Users prefer to follow the "Buy Global" method for all complicated weapon systems and platforms, rather than thoroughly analysing the "Make" option ahead of time. For indigenously designed systems, R&D organisations believe first prototype (at 80% acceptance level) should be inducted and an order placed with the industry for a specific minimum

quantity, while R&D organisations continue to improve to fulfil overall QRs. Once a form of acquisition has been determined, all stakeholders should remove their blinkers and demonstrate "Total ownership" by closely cooperating and understanding each other's concerns, as well as assisting with a helping hand to find answers. It is felt that this would show desired results and the dream of self-reliance in the defence could be fulfilled to a great extent. Furthermore, all stakeholders should come out of their respective silos, get-together, synchronise their own individual organisation's policies, priorities and perceptions with those of the other stakeholders.

Further, Defence acquisitions consists of three elements ie. Research and Development (R&D), production and finally the procurement (whether from foreign or domestic sources). In India, this process of acquisition requires a combination of technical, financial and operational expertise from a variety of stakeholders, which includes three military services (Army, Air Force and Navy who are the ultimate users of defence equipment), MoD, Ministry of Finance, Public-sector defence industry, scientific establishment, Private sector defence industry and Political leadership as the ultimate arbiter and decision-maker on matters of acquisition.

3.4 Acquisition Framework for PPP

The acquisition framework describes the relationship between the public sector, which includes the Government of India (GoI), ie the regulatory body, the DPSUs/ OFs, which have traditionally been India's sole arms and munitions manufacturers, the Armed Forces, and the private sector, which also supports to bring in more efficiency, competitiveness, and high-tech capabilities. However, significant obstacles hinder private enterprises from forging public-private partnerships. It is

opined that the improved policies and tactics would help to overcome these obstacles and promote the finalization of PPPs in India's defence sector.

Dilemmas Facing India's Defence Acquisitions

Together, the defence industrial establishment confronts a number of major dilemmas (Jaishankar, 2019)^{vii}. The economics of the defence industry do not follow the normal rules of economics, for several reasons:-

- (a) First, it is difficult and in some cases impossible to manufacture armaments in large enough numbers to benefit from economies of scale (barring certain equipment for the infantry). Major platforms are acquired in the dozens, sometimes hundreds, and rarely in thousands, although the Indian armed services' large size and requirements mean that India is better-placed than most countries to procure at scale. Nonetheless, the cost per unit in the defence business is extremely expensive, especially when research and development is factored in.
- (b) Secondly, the defence industry is a monopsony, with just one buyer ie Defence Services.
- (c) Thirdly, there are exclusive suppliers of a specific product. High capital expenses, closely guarded intellectual property, and the uncertainty of the procurement process are all barriers for the new entrants.
- (d) Fourthly, even when controlled by private corporations, defence technologies are subject to extensive regulation by national governments for national security reasons.

India seeks to acquire high-quality equipment, at a reasonable cost and in a short period of time, even though only two of these three are achievable at any given time.

In the acquisitions process, there are three options for dealing with this trilemma:-

(a) Cost. One option is to purchase high-quality equipment at a reasonable cost, but with the understanding that the process could take long time especially for complex systems. This may cause the induction of these platforms to be too late to fulfill critical Defence requirements, and given the rapid speed of technological obsolescence, the equipment may become obsolete before it is accessible.

(b) Quality. The second alternative is to buy high-quality equipment on short notice for a price that is comparable or higher than international market rates. Financial prudence limits this choice.

(c) Speed of Acquisition. The third option is to obtain low-quality equipment on short notice and at a low cost, albeit this may jeopardise preparation in comparison to competitors, especially those with significantly higher capabilities, such as China. As a result, significant decisions will need to be made about whether to forgo cost, quality, or speed of acquisition.

3.5 Major Initiatives of Government of India

The Indian government has taken enormous steps in the last three years to reposition India on the global map. Make in India, Digital India, Skill India, and other initiatives are among them. One of these i.e. Make in India initiative has a significant impact on PPP in India's defence sector. The goal of the 'Make in India' effort is to encourage investment, support innovation, improve skill development, safeguard intellectual property and construct world-class manufacturing infrastructure. New

Processes, New Infrastructure, New Sectors, and New Mindset are the four pillars of "Make in India".

3.6 Barriers to PPP in Acquisition of Defence Equipment in India

As brought out earlier there are certain hurdles in expanding private sector participation in Acquisition of Defence Equipment. These significant impediments could be mitigated by improved regulations and practices, allowing for a more robust and effective PPP in the Indian defence industry. DPP 2016, the eighth edition of the Defence Procurement Procedure, came into force on April 1, 2016. The methods for acquiring equipment for the Indian Army, Navy, and Air Force have been outlined in this document. The new policy's goal was to promote India's defence industry and support for 'Make in India' initiative. The introduction of Buy (Indian - 1DDM), a six-month deadline for Acceptance of Necessity (AoN), and Fast Track route to speed up procurement process were some of the major highlights of DPP 2016. In addition, certain other concepts were also introduced / amended to speed up the acquisition process and give thrust to indigenize the defence equipment. Some of these notable amendments of DPP which are considered to be milestone in giving fillip to indigenization by way of Make-in-India. It is through this document many contracts have been finalized. Some of the notable features of this document (DPP 2016) which have been revised as DAP 2020 are discussed below:-

3.6.1 Strategic Partnership MoD has unveiled its policy for identifying strategic partners (SPs) in the defence manufacturing industry. Selecting SPs to manufacture defence equipment has been recommended by the Dhirendra Singh Committee. However, the Indian business has not shown the same enthusiasm for Dhirendra Singh's approach as it should have been.

This is due to the proposal to limit the SP to only one segment. This will limit the ability of huge corporations such as Tatas and L&T, who can operate and partner in a variety of sectors such as aeroplanes, warships, command control, and communication.

3.6.2 Offset Offset is exclusively applicable to defence contracts in India, as it was initially established under the DPP-2006. According to the Defence Offset Guidelines, Indian enterprises engaging in Buy (Global) contracts for Rs 300 crore or more must give offset if their supplied product has less than 50% indigenous content. Direct offsets (agreements that are directly tied to the defence products being sold) and indirect offsets are the two types of offsets available. When comparing competing bids from diverse overseas suppliers, governments frequently assign offset packages a high priority. Governments rely on offsets to justify capital expenditures for defence upgrades by generating local investments and knowledge transfer.

3.6.3 No Cost No Commitment. Trial examination of product samples submitted by vendors whose technical bids have been judged acceptable by the Technical Evaluation Committee (TEC) is an important phase in Capital Procurement. The buyer conducts a no-cost, no-commitment (NCNC) trial evaluation of the products, which means that the government does not bear the cost of the trials and is not committed to purchasing the products after the trials. Trials are frequently too expensive, discouraging small and medium businesses from participating in the bidding process. Each participating vendor is responsible for customising and demonstrating his product to the client at his / her own expense, and even then, there is no assurance that he will be awarded the contract. This is because while several vendors'

equipment may pass the trials, the contract is awarded to the lowest bidder. Though the NCNC principle has reduced procurement costs, it has also hampered quality participation in the bidding process over time.

3.6.4 FDI. Government of India opened the defence sector to private Indian companies with latest limit of 74% for FDI. Some of the major factors that influence FDI in defence industry are:-

- (a) Rapid obsolescence of defence technology. Modern defence systems are extremely complicated and do not come from a single source. A systems integrator must be identified in addition to procuring / producing multiple systems, sub-systems and components for optimal performance.
- (b) Delays in this might result in equipment becoming obsolete with the manufacturer.
- (c) Defense equipment is a highly competitive and constrained market.
- (d) The majority of countries give priority to domestic manufacturers.
- (e) Major defence purchases are invariably an extension of a country's foreign policy. As a result, every potential FDI investor wants some assurance that the equipment produced will be sold.

3.6.5 Transfer of Technology. India's path to acquiring competitive defence technology and hence gaining assured capabilities against the

military challenges it faces can be divided into two routes ie indigenous development and imports: -

(a) **Indigenous Development.** This route was adopted in the 1950s when the DRDO, DPSUs and OFs were established. While overall indigenous development and production has significantly increased, but it has been offset by the faster evolution of defence technology in the world.

(b) **Import of Technology.** Competitive defence technology can be acquired through imports. ToT, comprises of arrangements wherein foreign supplier firms provide 'technology' for enabling the buyer to manufacture defence systems.

3.6.6 Business Environment. The government has three roles to play with defence companies ie as a consumer, sponsor and as a regulator. This is especially true because this is a one-of-a-kind industry in which the government is both the buyer and the regulator who sets procurement rules.

3.6.7 Ease of Doing Business. Ease of Doing Business is a term used to describe the ease with which one can conduct business. According to the current World Bank annual rankings, India is placed 130th out of 190 economies in terms of ease of doing business. The government has taken a number of steps to improve the Ease of Doing Business, with a focus on simplifying and rationalising current rules, as well as implementing IT to make governance more efficient and effective.

3.6.8 Lack of Synergistic Approach. In India's defence purchasing

process, R&D has been a major omission. R&D is typically done in bits and pieces, and is primarily seen as a result of the procurement process. The DRDO, whose fundamental duty is to design and develop cutting-edge weapon systems as well as give all essential technical assistance on weapon procurement, has been marginalized in the procurement process.

3.6.9 Skill Sets. The shortage of competent workers poses a severe threat to expansion of India's Defence industry. As defence production involves high precision manufacturing that necessitates specialised training and certification by international accreditation agencies, skill development is vital for establishing self-reliance.

3.6.10 Capital Costs. The high cost of capital in India is a major stumbling block to investment. While this affects all Indian businesses in all sectors, it has a particularly negative impact on MSMEs, who are subjected to much higher borrowing rates. Various plans aimed at providing loan rate subsidies to SMEs have mostly remained on paper.

3.6.11 Decision Making. Acquisition of arms, offsets, defence production, and other operations are scattered, resulting in unnecessary delays. The inability to make decisions quickly is eroding Indian industries' credibility with OEMs. To be effective, it would have to address the challenges of decision-making delays, as well as the bureaucracy's risk aversion, Flaws in the system for determining General Staff Qualitative Requirements (GSQRs) and conducting trials by the Services.

3.6.12 Preferential Treatment for DPSU's. DPSUs were given

preferential consideration because of the massive infrastructure built over six decades and the fact that the government owns it. However, being an extension of the Ministry of Defense, the DPSUs receive advance notice of the armed services' prospective procurement programmes and quickly sign MOUs with foreign suppliers to avoid competition and present a fait accompli to decision-makers.

3.6.13 The Problem of Secrecy. One of the concerns with PPP in defence production is that foreign partners will obtain access to sensitive information, posing a security risk. This argument is difficult to support or refute. It is not a big problem as it is made out to be, provided the right companies are chosen for the job.

3.6.14 Hurdles in Assessment of Price. In the defence market for specialized weapon systems, there are a number of hurdles before one even gets to assess a reasonable price before undertaking the acquisition. These are as follows:-

(a) **Limited Availability of Desired Products.** There is a limited range of products available which fully suit the needs of the buyer. This is essentially because defence-related weapon systems are built to suit the needs of individual countries and to fit their specifications and environment.

(b) **Built to MIL specifications.** Defence systems must be tough in order to perform successfully in a hostile and severe environment, and they must also last significantly longer life than commercial

systems. As a result of these restrictions, they are often built to MIL standards.

(c) Buyers' Demands. Added to all this, each buyer country has its own peculiar requirements that they place on the vendor. Apart from long life and assured product support, each country demands a certain technical performance, delivery schedules, maintenance & logistic support, offsets, ToT, warranties etc. Further, the product which is sold to one country may not truly useful to another country due to different terms and conditions.

(d) Extensive R&D in Design and Limited Production Run. Due to restricted markets and declining defence budgets, the design of the best feasible weapon system within the existing or anticipated technological capability necessitates a significant R&D effort, the costs of which must be amortised over a short manufacturing run. It is frequently stated that by the time a system is actually incorporated into operational units, it is nearly obsolete, and designers must begin work on prospective improvements to make it operationally functional for the duration of its expected life.

(e) Limited open pricing information. Unlike commercial products in the open market, there is little real and reliable information on system costs that is readily available. Such information is commercially sensitive and is rigorously protected by each company for use in future bids in other competitions or countries.

(f) **Bids may not be Based on True Costs.** It's possible that bids aren't based on true costs. Due to a variety of factors, including political considerations, price bids in the defence market may not necessarily be based on genuine costs.

Improving Oversight of Indian Defence Acquisition

Defence acquisitions are crucial for national security since they influence the armed services' operational readiness. Procurement accounts for over half of the defence budget, both revenue and capital. Since scarce resources must be diverted from the much-needed social and developmental sectors, this large expenditure incurred on defence acquisition comes with a significant opportunity cost. As a result, not only all stakeholders, but also the monitoring authorities, are concerned in ensuring that this money is wisely spent. The fact that defence acquisitions are extremely vulnerable to corruption adds to the increased monitoring issues.

(a) **Transparency.** India's vulnerabilities are exacerbated by the fact that it is the world's largest weaponry importer and its procurement system is still in its infancy. Thus there is a need to ensure transparency in all defence procurements.

(b) **Concerns about oversight in defence acquisitions.** In defence purchase process, there are two key major concerns which needs to be monitored and these are value for money and honesty. Other considerations, such as fairness and transparency, are subsumed under these two.

(c) **Value for Money.** Value for Money is a crucial notion in defence acquisition, because it is at this moment when all stakeholders' interests and expectations gets aligned. Only competitive price discovery can secure the right price for a product. Objectivity, integrity, fairness, and competition are not only ethical standards, but also important aspects of value for money. Compromising any of these characteristics puts the acquisition at risk of not only corruption, but also diluted quality, higher costs and delayed deliveries. As a result, the executive's attempts to provide value for money are complemented by the role of oversight. Thus, in defence acquisition, Value for money means:-

- (i) That the acquired product meets the user's requirement or the "capabilities sought for", in the best possible manner.
 - (ii) That the product is acquired at an optimum cost of ownership.
 - (iii) That the product is acquired at the shortest possible time.
- Putting it simply, it means buying the right product, at the right price and at the right time.

3.7 Checks and Balances

In India, there are five important entities to exercise 'Checks and Balances' that play significant role in defence acquisition. These are as follows:-

- (a) **CAG.** The Constitution of India mandates the Comptroller and Auditor General (CAG) to examine and report appropriateness (or otherwise) of all government expenditure. The CAG's reports are presented to parliament and thereafter examined further by the Public Accounts

Committee (PAC). Following the executive's explanations, the PAC makes recommendations for corrective action.

(b) **CVC.** As an independent anti-corruption organisation, the Central Vigilance Commission (CVC) plays a punitive role in maintaining procurement integrity and transparency. It can investigate and assess the possibility of corruption as a preventive measure and recommend systemic or procedural changes. It also releases rules from time to time to ensure integrity in public procurement.

(c) **CBI.** The Central Bureau of Investigation (CBI), which is in charge of investigating cases of corruption, accords high priority to defence acquisitions.

The CAG, CVC, and CBI, together known as the 3Cs, are feared by defence acquisition managers. The Central Information Commission has played a critical role in fostering transparency in all sectors of governance since the passage of the groundbreaking Right to Information Act in 2004.

Besides the PAC, parliamentary oversight over the Ministry of Defence is also exercised through the Parliamentary Standing Committee on Defence, which conducts detailed study on various issues of concern and gives its recommendations. In addition to external oversight agencies, internal audit and the system of Financial Advisors, who undertake due diligence and give approval to all financial plans, provide effective internal oversight.

3.8 **Problems Related to 3C's In Defence Acquisition**

Few problems are as under (Subramaniam, 2013) ^{viii}:-

3.8.1 Negative Effects of a Compliance. Officers working in public procurement in India, particularly those involved in defence procurement, live in continual terror of the 3C's—the CAG, CVC, and CBI which prevents them from making swift, daring, or innovative judgments. Officers are terrified of making or approving decisions, therefore they try to avoid responsibility by diverting and dispersing it, which is a significant source of all delays. The monitoring agencies are to be blamed for instilling a risk-averse work culture. The Indian monitoring system places an unnecessary and improper importance on adherence to procedures in a narrow sense, even if it comes at the expense of outcomes. This is why, Indian bureaucracy has grown more process-oriented than outcome-oriented.

3.8.2 Officers are willing to forgo results in order to ensure that process and regulations are followed blindly in the narrow sense that they understand them. One would question the utility of the regulations, procedures and guidelines if their violation was acceptable. How can they be enforced if non-compliance isn't punished? The reason lies in the fact that India's public procurement policies and procedures have significant flaws. Officials must choose between engaging in irregular behaviour and engaging in impropriety. The officers in the play-it-safe group pick the latter because the Indian system penalises irregularity rather than imprudence, whereas achievers are unconcerned about "bending rules" to attain their objectives.

3.8.3 Rules and procedures. They specify acts aimed at upholding certain fundamental principles such as integrity, value for money, objectivity,

fair play, and competition, among others. In the end, the principles are more essential than the regulations, and if the principles are followed even if the rules are broken, there should be no problems. In the Indian system, however, procurement procedures and laws primarily cover the operational aspects and do not address the underlying concepts. The rules are written in the form of dos and don'ts, and the decision makers have very limited operational freedom. If organisations were to be run merely on the basis of checklist of rules and procedures then qualified and experienced managers would not be required to steer organisations.

3.8.4 Procurement officials are confused by a multiplicity of regulations and procedures provided by several bodies, many of which clash with one another. There is no criterion or norm by which a procedural infringement can be judged. When raising an observation of a procedural violation in India, the oversight agencies rarely quote the precise regulation that was broken, and the decision is made based on the vigilance officer's or auditor's subjective assessment. Oversight agencies lay an excessive amount of emphasis on procedural violations while overlooking the circumstances in which the alleged violation occurred.

3.8.5 Many of India's current public procurement concepts and rules are out of touch with the realities of modern concept of supply chain management. Despite the fact that almost all procurement processes choose limited tendering as a competitive tendering process, there is a general belief that it is prohibited. Today, it is obvious that limited tendering, which involves asking offers from a small number of vendors based on quality and capacity,

provides greater value for money than an open solicitation that invites everyone. The new Indian defence acquisition policy which focuses on developing indigenous defence industry and unless this conflict is resolved, it would turn out to be a major roadblock.

3.8.6 The criteria for public procurement in India aren't based on a thorough risk assessment or a cost-benefit analysis. Any stipulation or procurement rule enacted to assure integrity, transparency, or value for money imposes costs (in terms of money or time) in addition to the advantages that may result from its execution. A cost-benefit analysis should underpin every procurement procedure or guideline. Many of the procedures and norms that regulate public procurement in India are not based on such a cost-benefit analysis, and as a result, they are more burdensome when compared to the risk they are attempting to mitigate.

3.8.7 Therefore, a “procedural violative focussed” approach by oversight especially vigilance wherein probability of corruption is assumed from the mere observation of procedural deviations has disastrous consequences resulting in harassment to the honest, proactive and goal oriented officers.

3.8.8 Oversight Remains Ineffective as no Action is taken on its Outcomes.

Because no action is taken on the outcomes of oversight, it remains ineffective. The Defence Ministry does not transform the observations and recommendations given by oversight committees into insight in order to improve the procurement process. The ultimate goal of oversight is to strengthen governance and to act on the findings of oversight engagements.

3.8.9 **Inadequacy of Parliamentary Oversight**^{ix} (Subramaniam, 2013)

Establishing optimal practises requires not only knowledge and competence, but also resolve and conviction. In this regard, political will could operate as a motivator to force the defence bureaucracy to make the required changes. Effective parliamentary supervision can actually help to improve the quality of the government's policies and programmes, giving them more credibility and thereby boosting acquisition managers' confidence. Few steps in order to boost up the acquisition process :-

(a) **Frequent Amendment to the Acquisition Procedures.**

Rather than to improve Systems, a key error is that systemic issues are addressed by simply amending the DPP. Many of these adjustments are in response to oversight agencies' observations and are aimed at preventing recurrence of the problems. This strategy of tinkering with procedures rather than strengthening systems and addressing the fundamental cause of the problem only adds to the confusion. As a result, even when the Ministry releases a new DPP roughly every two years, the systems stay unchanged and the issues remain unresolved.

(b) **Formulation of QRs.** The formulation of Qualitative Requirements (QRs) is the most significant stage in the defence procurement process, since it influences all other important decisions.

The following are some of the flaws in the QR formulation system:-

- (i) Rather than defining the capabilities sought in terms of functional and performance parameters, QRs are expressed in terms of technical specifications, often in terms of specific

values that either do not correspond to products in the market or, in some cases, correspond only to a single product, resulting in bias toward a single vendor.

(ii) When the weapon system is to be indigenously designed or produced, the development or production agencies convert these user needs into detailed military and technical specifications for R&D and production purpose. Stipulating narrow QRs restrict competition and choice; and therefore do not enable selection of the most optimal product.

(iii) The QR standards are frequently discovered to be incompatible with technology accessible in the global market, incompatible with each other, and incompatible with ground realities.

(iv) Due to a shortage of testing facilities, the parameters mentioned in the QRs are frequently unable to be tested during trial evaluation. These flaws in the QRs cause significant bottlenecks in the technical selection of weapon systems, which are then alleviated by changing or waiving the QR criteria.

(v) The problem's primary cause, incorrect QR formulation, was never addressed. DPP prohibits changes to QRs after the RFP is issued, particularly in the case of

indigenous development. Many of the alterations made to the QRs are haphazard and situational in nature.

(c) **Technical Evaluation** The second major bottleneck in the defence acquisition process is the way technical evaluation is carried out. Not only are there severe delays in field trials but also the process of evaluation is more of a subjective assessment and discretion creeps in. The discrepancies in the QR formulation as discussed above, further vitiates the process of trial evaluation and technical selections. In the absence of an objective and quantitative method of evaluation the selection of the optimum product cannot be ensured. As a result, many critical procurements are hampered due to representations, complaints and investigations.

(d) **The Menace of Complaints.** Concerns from competing bidders or vested interests frequently hold the Indian defence acquisition system hostage, as these complaints cause fear among acquisition officials. A slew of complaints have ruined a number of crucial procurements. To deal with this threat, solutions must be found. It will be interesting to see if the implementation of the Integrity Pact will result in decrease in complaints.

(e) **Requirement of Integrated Defense Acquisition Organization.** In India's defence acquisition, multiple agencies with different responsibility centres are involved, resulting in a lack of coordination, dispersed accountability, and delays. In the case of capital acquisitions for the Army, for example, thirteen distinct

agencies are involved in the process, each reporting to various functional heads. The acquisition procedure has eight steps, and throughout each stage, the case is shuttled between the Service Headquarters and the MoD. The Ministry's capital acquisitions wing has been renamed the acquisition wing, and secretariat personnel have been re-designated as managers. The services only give the user requirement, the quantity of the product required and the time by which the product is required. It is then the responsibility of the acquisition organisation to make available the best possible product at optimum cost within the given time.

(f) **Re-engineering of the Acquisition Process.** The way a procurement proposal is processed is a primary cause of delay. From the start of the case through the signature of the contract, the procurement case had to go through various steps of processing in order to be completed. Unless this technique of processing is fully reengineered, the processing time cannot be lowered. There is a need to check the requirement whether these stages/steps are required to be undergone by the proposal.

(g) **Capacity Building of Acquisition Managers.** Defence acquisition is a multidisciplinary operation that necessitates knowledge in technology, military, finance, quality assurance, market research, contract management, project management, and supply chain management among others. The Indian defence acquisition system lacks such specialisation, which is critical given the increasing

complexities, long lead times, and high acquisition costs. Personnel in charge of procurement have no experience or training in project management, procurement, or contract management. Service officers on term postings of no more than three years do technical processing in the Service Headquarters.

3.9 Defence Acquisition Procedure 2020 (DAP 2020)

After deliberations that lasted over a year, MoD released in September 2020 the Defence Acquisition Procedure 2020 (DAP 2020) to further streamline the procurement process and provide a boost to indigenous arms manufacturing. The 657-page document, which supersedes the 489-page DPP 2016, is the second attempt of the government of Hon'ble Prime Minister Shri Narendra Modi to streamline India's defence procurement system and promote 'Make in India' in defence manufacturing. The revised procurement manual improves on some of the previous document's provisions while also adding new ones.

The DAP 2020 makes a valiant effort to promote greater indigenisation and expedite procurement and for speedier acquisition. To be sure, the essence of this procurement manual remains the same as in earlier versions. It still has a procurement categorization system to help domestic arms manufacturers, as well as a multi-stage procurement process, customised processes for specific types of procurement, a standardised tender document template, and a detailed offset guideline. It also specifies the duties and responsibilities of the different authorities participating in the procurement process.

3.10 Harnessing PPP

(a) One of the goals of a well-designed PPP is to identify and integrate the capabilities of each sector. As a result, a public-private partnership emerges that is stronger and more efficient than either party could achieve on its own. As a relatively new player in the defence sector, India faces a number of challenges that threaten the success and viability of PPP projects, including intellectual property concerns, excessive bureaucratic requirements, and government distrust on the private partner.

(b) When these obstacles are combined with the small defence industry, PPPs become an unprofitable alternative for profit-driven businesses. There are huge financial risks and delays involved in large scale defence acquisition programmes that do not ensure timely return on investments to the equity based private companies. Uncertain demand patterns, changing user requirements, rate of technological change and high project costs lead to further complications in the pursuance of the partnership.

(c) PPP is an effective contracting model but, it cannot be successful unless a planned, structured and transparent acquisition/ production system exists. OEM will look for qualified Indian firms that can gain the necessary knowledge over time. DPSU's infrastructure and strengths would be optimally utilised at the same time. To ensure such an outcome, it is necessary to evolve a long term strategy keeping in mind all similar acquisition programmes, review the factors that contribute in determining the right numbers and begin the process of building a long term partnership with the private industry.

(d) Partnerships with linked objectives that are properly planned, structured, executed, and assessed can create a strong foundation for a successful PPP model. Understanding the specific environment in which PPPs operate and making them flexible to changes is critical. An eco-system exists in the country for PPP.

(e) Details of industries who have partnered with foreign companies is placed as **Appendix 'A'**. Details on models adopted by various countries under PPP for defence acquisitions is placed as **Appendix 'B'**.

3.11 Conclusion

The defence acquisition system in India is fraught with delays and inefficiency due to the lack of integrated acquisition organisation, due to short comings in the major functional areas such as QR formulation, technical evaluation, vendor development and costing. The problems can only be overcome by reconfiguring the acquisition organisation, the systems and the processes, so as to make them more professional, scientific and objective.

For effective defence acquisitions, multiple departments and organisations' policies and procedures must be synchronised with the DPP (now DAP 2020). The Indian public and private industry have the wherewithal to work with international corporations to support the Indian armed forces while also carving out a niche for themselves with cutting-edge technologies. Various initiatives of GoI have given the necessary fillip to defence acquisition in the country and have sought to identify, evaluate and manage the constraints and challenges posed by the PPP model in the infrastructure for acquisition of defence equipment.

Chapter IV: CHALLENGES AND ADVANTAGES IN ACQUISITION OF
DEFENCE EQUIPMENT THROUGH PRIVATE SECTOR

After the acquisition of equipment, the next stage is to manufacture and maintain the same in the country. It is a well-known fact that procurement of defence equipment and systems ex-import is carried out by the government to meet the unavoidable and urgent quantity so as to maintain minimum acceptable level of operational preparedness. With such minimal quantity being imported, it would meet the nation's immediate requirement but for future there will be need to manufacture the same within the country so as to maintain the required level of preparedness and maintain the required stock levels at all times. Local manufacture would ensure that equipment and its parts are indigenized which will avoid draining of funds to other countries. In order to undertake this, there is a need to get ToT from the foreign vendors so as to manufacture the equipment for future requirement within the country. Once the manufacturing takes place locally the dependence on foreign vendors would be totally over and country would become self reliant, in consonance with the Make-in-India theme.

Hardly any foreign government does give consent to transfer technology, particularly for the defence systems, to another country in the current situation. To gradually increase India's self-reliance in defence systems, the three Services, R&D facilities, commercial and public sector production agencies, and other cooperating entities must work together. Today, India encounters twin problems. On one side there is a large scale strengthening of its neighbours, through supply of arms and clandestine support to the nuclear and missile programmes and on the other side all efforts are being made to weaken India's indigenous technology growth through control

regimes and dumping of low technology systems. Growth of indigenous technology and self reliance are the only answer to this problem.

4.1 **Reasons for Slow Progress of PPP in Defence**

PPPs have achieved effective turnarounds in a variety of sectors, but the situation in the defence sector is somewhat different. Various regulatory and industrial measures aimed at bolstering India's indigenous defence manufacturing capability through private sector engagement have failed to deliver the expected outcomes. The government has been unable to take advantage of the private sector's inherent advantages, such as the creation of a reservoir of management, scientific and technological skills, and self-reliance. Other issues of the private sector when it comes to defence are highlighted below:-

- (a) Huge investments and capacities in DPSUs resulting in the fear of private industry being progressively edged out in a competitive race
- (b) The concern that the private sector may not respond to national requirement in times of crisis in the same manner as a government- owned unit would.
- (c) Doubts about the design capability of the Indian industry and absorption of technology by them.
- (d) There are hardly any systems that cannot be manufactured by the private sector.
- (e) Further, critical information can be unknowingly shared with the country from which equipment has been imported.

Countries all over the world are attempting to enlist the private sector's participation in the defence industry in order to capitalise on its skills and focus on strategic R&D. Private sector will be cost-effective, improve indigenization, assist in job creation, and benefit both government and private actors by merging their skills. The money saved can be used by the government to reinvest in other areas. As a result, the defence industry must increase its acquisition capabilities through PPP. Further, the industry has shown a keen interest in the opportunities on offer and many large industrial houses have shown an inclination to assume the role of system integrators by investing in R&D, infrastructure and develop capabilities in defence production.

4.2 **Present Status**

The state-owned defence public sector, which includes the DRDO, DPSUs, among others, has superior technology, an excellent infrastructural base, big production facilities created over decades, consistent government support, and competent human resources. The private defence sector remains mostly unexplored, waiting and watching from the periphery and participating in a few projects. They are capable of attracting foreign investments, utilising the most cutting-edge technology accessible globally, employing best management techniques, and forming mutually beneficial partnerships with foreign enterprises. Hence, a partnership of the country's public and private defence players will result in synergising their strengths and prove mutually beneficial for achieving the long pending overall national aim of self-reliance in the defence sector.

The use of the PPP model for acquisition in the defence sector will be a better mode of acquisition. One of the key thrust areas is that using the PPP model for acquisition in the defence sector might significantly increase the efficiencies in development of

product, thereafter its production and maintenance can be further looked after by private sector.

The advantages of the PPP model of acquisition over other traditional types of public service acquisition, such as outsourcing or outright privatisation, include improvements in service delivery speed and turn-over, technical know-how, sustainability, and accountability.

4.3 Defence Acquisition and Private Sector

Due to Industrial Policy Resolution, the Defense sector had traditionally restricted private companies. The underlying idea has been that critical industries must remain in the public sphere in order to provide security and reliability during times of crisis. The status of the private sector industry in terms of materials subsystems and components is more akin to that of subcontractors. However, private sector was opened for defence sector in 2001 and thus was due to two reasons. The first is state-owned industries' failure to meet the armed forces' various requirements. The second is success of the private sector following economic liberalisation, which began in the early 1990s. A few questions that spring to mind as a result of this are:-

- (a) How does the Private Sector participation in Defence Production affect the demand and supply of arms/ammunitions and other weaponry?
- (b) Does Private Sector participation lead to an increase in exports and decrease in Imports?
- (c) Does Private sector participation lead to an aggravated threat to national security?
- (d) Is there a significant impact on the magnitude of lobbying and political favoring?

Make in India was announced in 2014, the Defence Procurement Procedures (DPP) had previously undergone eight major changes. However, it was the reforms that began in 2006 which introduced certain private-sector-specific opportunities, by outlining two critical procurement categories: Make and Buy and Make and Sell (Indian). Under these categories, the private sector was required to carry out important contracts in the same way as government agencies did. In a short period of time, the private industry had shown its capabilities in the areas of management, high-end manufacturing, and market capitalization. The private sector has also demonstrated dynamism by establishing production facilities and forging joint partnerships with large international defence companies. Details of the projects undertaken with private sector participation is placed as Appendix 'C'.

Based on the foregoing, it is necessary to determine how the private sector should be regarded in defence production. India's defence sector is expected to dwell upon modernization and re-organisation in the coming decade in order to become self-sufficient. The latest Strategic Partnership policy for defence production aims to increase private sector participation in India's defence industry.

4.4 Defence Products and Private Industries

Most defence equipment/ systems are complex and cannot be manufactured by a single country. Even most developed nations enter into certain strategic partnerships in producing a product related to a weapon system. In long term, self reliance in defence equipment will not only booster the inner core strength of India, but will also have spin offs in terms of private industry utilizing this technology and experience so gained in making related equipment and products of global standards. Globally,

defence industry thrives on three major factors, one to fuel the needs of those nations which aim at generating credible deterrence, second as any industrial company to its competitive bidders thereby making this a global market endeavor and lastly increased demand in the Asia region for defence related products. Some of the challenges that lay before our private industries are given below:-

(a) **Engineering Collaboration / Joint Venture.** In order to enhance core engineering strength in defence products, Indian private industry will need to integrate with global defence companies. This is necessary since all defence equipment must meet high quality standards and technology which should be latest to support defence forces.

(b) **Time is essence.** One of the most important factors for Indian private business is to provide world-class defence items within specified timeframes. To ensure minimal delays in the production process, ToT and OEM support would be required for important assemblies and production processes.

(c) **Logistics.** Without a solid logistical infrastructure, no industry can survive. As a result, an Integrated Logistic System would need to be developed in close collaboration with worldwide partners.

(d) **Infrastructure.** If defence equipment and products are to be developed in-house, capital expenditure and infrastructure setup are required. Before any defense-related equipment can be manufactured, it is necessary to have a thorough understanding of technology and what would be required in terms of infrastructure to undertake production after acquisition is carried out.

(e) **Global Regulatory and taxation policies.** To enter the defence equipment market, the private sector must be aware of global regulatory norms and taxation laws. Intergovernmental agreements and Memorandums of Understanding (MoUs) between global companies and the Indian private sector must be in place for the project to succeed which would ensure a long-term and stable flow of technology, information, and raw materials.

(f) **Barriers in Communication.** When interacting with most countries, language, customs, and processes can be difficult to navigate. These gaps must be filled in order to increase international engagement in Indian defence industries.

4.5 **Reasons for Non-Effective Participation of Private Sector**

4.5.1 **Historical Perspective.** In the last six decades, the defence industrial base has been limited to the public sector. The critically important defence, telecommunications, and space industries were designated as closed sector industries. In January 2002, the government opened defence production to commercial sector in order to encourage defense-industry collaboration. However, due to the reasons outlined in the following paragraphs, private sector participation remained unsatisfactory.

4.5.2 **Policy Issues.** The DAC decides whether to classify a proposal as 'Buy,' 'Buy and Make,' or 'Make,' based on input from the DRDO and the public sector. The private sector is not asked for any kind of feedback. Its expertise and potential are completely ignored. Even if a private sector organisation is better equipped in terms of infrastructure and knows how to

absorb the technology, the selected beneficiary in all ToT negotiations is always a DPSU who may have to build whole facilities from the ground but a private enterprise may merely require incremental technologies.

4.5.3 **Procedural Issues.**

(a) **Projection of Requirements.** Requirements of Armed Forces are not made known to the private sector and the time given for the submission of proposals is grossly inadequate.

(b) **SQR's.** Parameters for equipment to be procured are formulated with foreign equipment in mind, after reading manufacturers brochures.

(c) **NCNC Clause.** All trials are carried out on disadvantageous 'No Cost No Commitment' basis. There is a requirement of either giving some firm commitment or sharing cost / resources for equipment which is proposed to be developed specially for defence.

(d) **Bureaucratic Framework.** Even the most ardent optimists can be dissuaded by India's bureaucratic shackles. The applicant firm must be an Indian corporation or a partnership. The company's management control and majority representation on the board must remain in Indian hands. To put it another way, a foreign investor is expected to invest his money without having a say in the decision-making process. The licencing authority has the authority to investigate overseas collaborators' and domestic promoters'

backgrounds, including their financial position and credentials in the global market.

(e) **Production Capacity Limits.** This provision appears to be intended to protect the public sector's interests by prohibiting any competition to their existing monopoly. The licence issued to the private company will include manufacturing capacity standards, which will be determined after taking into account existing capacities for similar and related items. Only licenced products and quantities are allowed to be produced under a licensee. Once production commences, government will inspect all safety and security measures.

4.5.4 **Functional Issues.**

(a) **Registration of Vendors.** Although Technical Managers in MoD are the designated authority for certifying the potential of company. However almost all defence procurement agencies have independent systems for registration of vendors for the particular range of items. Any vendor interested in doing business with the defence must contact the procurement agency individually for product-specific registration in order to be considered for tender inquiries.

(b) **Economy of Scales.** Every manufacturer seeks economies of scale and requires a steady stream of orders. Regrettably, RFPs are sometimes issued for one-time quantities without stating the anticipated total requirement over a period of time. Furthermore, no long-term commitment to a consistent flow of orders is provided. This

discourages businesses from investing their resources in setting up production facilities, as the effort is both costly and risky.

(c) **Sale Restrictions.** The policy directive stipulates that arms and ammunition will be primarily sold to the MoD. Their sale to other security organisations in the country, as well as exports, will be subject to government permission. Non-lethal items may be sold to non-government agencies with the approval of the MoD.

(d) **Quality Control.** The applicant company must supply the required quantity of item to quality assurance agency with the standards and testing processes for the equipment to be produced. Furthermore, the government retains the authority to inspect the final product and undertake quality assurance audits.

(e) **Product Acquisition.** According to policy, public sector producers may be given purchase and price preference. However, the same does not apply to private defence industry entrepreneurs.

(f) **Testing Facilities at the National Level.** Defence equipment is expensive, and since continuous testing and quality checks for ruggedized military specifications are required for every part, sub-assembly, assembly, system, and sub system it is not possible for industry to do so with its own resources.

(g) **Lack of Mutual Trust.** The public sector has grown accustomed to having a monopolistic position. Their fear of losing business makes them leery of any attempt to ease the private sector's entry, and they try

every tactic to prevent it. Many government officials, on the other hand, believe that the private sector is only interested in making a quick buck and lacks required perseverance.

(h) **The Communication Gap.** At the policymaking level, there is no efficient institutionalized single interface between the MoD, the services, and the commercial sector for frequent dialogue. A variety of organisations or collaboration forums exist, but their utility is limited to the sharing of ideas. Procurement organisations are eager to promote domestic production. They are, however, unaware of the capabilities and potential of various private sector enterprises. MoD does not have a useful data bank on Indian industries. Many private sector enterprises have the potential to manufacture a wide range of defence needs, but they don't know who to contact for more information.

4.5.5 Organizational Behaviour and Attitudinal Change The process suffers from indifference, apathy and inefficiency. Dealing with the military continues to be a difficult and intimidating undertaking for the industry. Businesses are viewed as adversaries. Without a guarantee of defence business, vendors are expected to make significant investments. Currently, the DDP in the defence ministry is solely responsible for public-sector firms. The private sector continues to be overlooked. DDP should be reorganised and renamed DDI, with much broader responsibility to include private sector.

4.5.6 Other Impediments for Private Sector Participation. There are few notable other impediments for private sector participation in Defence sector which are hesitant attitude in the mindset of the private sector wherein

the Private sector is looking for immediate returns in the short term. Further, User is apprehensive about the sustained supplies and services from the private sector. User is also doubtful about the maintenance of quality and upgrading the production and services on a regular basis. In-addition to this, the private industry is apprehensive about rapid obsolescent rate. Security is of major concern while operating with private sector.



Figure 5 SWOT Analysis of private industry
Source

4.6 Initiatives by GoI for participation of Private Sector

In today's technological inter-dependent world and globalisation of economies, keeping the private sector outside the purview of defence research and production has been technically and commercially a flawed concept. For a developing country like India, to accelerate its Defence Industrial base, it has broadly two options to choose from either to develop technologies in-house. This alternative, of course, necessitates technological know-how, professional technical/scientific knowledge, research and development infrastructure, and capital investment. The

second option is to obtain technologies from another country. Importing technology into the defence sector appears to be an easier task but has number of drawbacks. A country must first discover a donor ready to part with cutting-edge technology, and then determine the price that must be paid for the same. Some of the recent initiatives by the government to enhance the participation of private sector in Defence Production are enumerated in the succeeding paragraphs.

Foreign Direct Investment (FDI). The FDI provision was designed for the purpose of luring technology to India, not for financial reasons. The private sector's lack of experience in defence manufacture, as well as India's limited R&D base, contributed to the choice for technology. Given the strategic and technological nature of investment, no foreign vendor wants to hand over technology to a partner in India over whom it has little influence. This has now been increased to 74 percent so that the foreign vendors gets lured and technology can be brought to our country.

Categorisation of Acquisition. In the acquisition categories, the 'Make' procedure shows a great deal of confidence on Indian industrial capability. Orders will be placed on Indian enterprises based on the category, and these companies will then negotiate with interested overseas corporations for technical and other production arrangements. The 'Buy and Make (Indian)' programme offers the private sector the chance to develop joint ventures with overseas corporations.

Offset Policy In 2005, the Ministry of Defense announced a formal offset policy to redirect India's massive arms import cost toward boosting local industrial competence. Since then, the policy has been revised three times. From the standpoint of the commercial sector, the policy gives international enterprises the same chance

as the public sector to get offset advantages from Indian offset partners for the discharge of their commitments.

4.7 Views and Recommendations of Private Industries

Industry associations have stated that the growing interest in private sector participation in Defence Production is evident by events such as conduct of exhibition and seminars on Defence partnership by CII and the Armed Forces. The Industry associations have geared up to launch a strategic partnership aimed at cutting down imports of Defence equipment. Hon'ble Prime Minister's plan to "Make in India" is a fantastic idea. In this context, Indian Industry have expressed their confidence that it is fully capable of manufacturing world class Defence equipment. They have outlined their expectations and apprehensions as follows:-

- (a) Strong Defence R&D base should be developed in the country and focus laid on certain core technologies to become centres for excellence.
- (b) Government should facilitate public and private partnership for co-development and co-production. Parity between Public sector and private players should be observed.
- (c) Export oriented Defence Industrial base should be developed. Simultaneously, multi-national alliances for co-development and manufacture should be encouraged. Private domestic players should be encouraged to set up joint venture with foreign companies to obtain ToT from abroad.
- (d) Mechanism for sharing of user's requirement with private sector in greater detail should be devised. An independent body should be set up for

accrediting companies and suitable mechanism evolved for sharing of information with accredited companies.

(e) Forecasting by Service HQ's needs much more deliberation. LTIPP (now ICAP) has come a long way, but there needs a change in perspective. It is necessary to inform defence industry of what is expected of them. More transparency is required in LTIPP's which should be on open-domain.

(f) Purchase Commitment. Service HQ should be doubly sure and certain about what product is required, because the industry invests cash in R&D to make prototypes. Midway change of QRs, will put a lot of burden on industry and the work will have to start again. If the user is hesitant, user-industry collaboration will be a better alternative. There must be an NCFC, with Govt sharing the expenses and the risk also.

(g) DPSU's have been given a preferential edge in acquisition. It's understandable that they're a Govt agency with workers but atleast, allow private players to compete on an equal footing. After receiving definite orders and a 30% advance, DPSUs/OFs form JVs with private players, freeing up production capacity for future orders.

(h) Authority on IPR. Where technology has been developed by a private industry, at its own costs, there is no way that the IPR's (Intellectual property rights) will be handed over to anyone, not even GoI, since it had no stake in it. If at all it has to be shared, a legitimate fee will be charged.

Advantages of Private Industries in Defence Sector (Deb, 2020)^x. In order to establish themselves in defence sector, private businesses must provide exceptional

efficiency and on-time delivery. It is critical to maintain proper efficiency in order to reap large profits. The majority of private businesses in India's defence sector now have a strong track record of efficiency. The following are some of the benefits of private industry in the defence sector:-

(a) End of Monopoly and Competitive Pricing. Previously, DPSUs had a monopoly in defence sector. OFB had a monopoly on the Indian armaments market. Despite spending a large amount of money, the products lacked the quality and upgradation in line with the latest specs.

(b) R&D and Innovation. These are two words that come to mind when thinking about R&D. In order for private firms to survive in the market, they must invest in R&D. This is not the case with the PSUs. The government's approval of funds for DPSUs always leads to long delays. Sometimes a project has to wait so long in the pipeline that it loses its relevance. Private companies do not need to wait for fund clearance from Govt to begin R&D.

(c) Quality. Private businesses must maintain their quality standards in order to be competitive. OFBs is accused in India of producing defective and low-quality products. Despite several complaints, OFB has taken no action to rectify the situation. Despite this, the army was obligated to buy ammunition from OFB since it had no other choice. When there are multiple sellers, quality and pricing become highly critical considerations.

(d) Opportunities for export. The floodgates to global market outside the home market opens up, whenever there is a manufacturing ecosystem

capable of surplus production. With numerous enterprises producing same defence equipment, India will be able to export it to other countries.

(e) Efficiency. In India's defence sector, PSUs have a poor track record in terms of efficiency. Ordinance factory boards are frequently chastised for their inefficiency. HAL has a reputation for not executing orders on schedule. The PSUs are unable to meet the needs of the armed forces despite having a huge and skilled workforce. This kind of delays would not be seen in private industries since they normally stick to the timely schedule for supply so as to get the returns on their investment

Disadvantages of Private Industries in Defence Sector.^{xi} Various disadvantages of private industries in Defence sector are as under (Deb, 2020):-

(a) Security. Indian government has been hesitant to privatise the defence sector for a long time. This was primarily due to concerns about security. When sensitive data is sent to a private company, it is extremely difficult to keep it safe. There have been numerous instances where private defence businesses have exposed critical information for financial gain. In India, the government intends to transfer several DRDO-developed technologies to private companies in order to assure speedier and more cost-effective production. However, the risk of sensitive data falling into the wrong hands cannot be overlooked.

(b) Reduced Control. When a private corporation develops a specific defence product, the control on the product remains with that country as long as the product is manufactured on its soil. There is no problem as long as the

firms stay ethical, but as soon as they begin to compromise their ethics for more profit, they become a national menace.

(c) Lobbyists to Promote Arms Sale. Lobbyists are frequently hired by private firms to advocate the sale of weaponry.

SWOT Analysis of Defence Industry.

At this point, it's important to look at the Indian defence sector's strengths, weaknesses, opportunities, and threats (SWOT). The sector is prepared to develop by leaps and bounds as a result of significant thrust of 'Make in India' drive. With neighbours constantly arming themselves with large sums of money, India must be technologically advanced to keep up with and even get ahead of them.

<p style="text-align: center;"><u>STRENGTHS</u></p> <ul style="list-style-type: none"> ➤ Huge and consistent Demand ➤ Sufficient Manufacturing infrastructure ➤ Sufficient R&D facilities ➤ Large pool of scientists, engineers and skilled manpower 	<p style="text-align: center;"><u>WEAKNESSES</u></p> <ul style="list-style-type: none"> ➤ Lack of indigenization resulting in high import ➤ Minimal absorption of Technology ➤ Inability to retain talented scientists ➤ Unfavorable policies like Taxation ➤ Lack of level playing field for private sector
<p style="text-align: center;"><u>OPPORTUNITIES</u></p> <ul style="list-style-type: none"> ➤ Domestic industry can be benefitted by Offset policy ➤ Private sector participation ➤ Increased FDI limit to 74% ➤ Make in India and Atmanirbhar Bharat Initiative ➤ New DAP -2020 ➤ Steps taken for Ease of Doing Business 	<p style="text-align: center;"><u>THREATS</u></p> <ul style="list-style-type: none"> ➤ Over dependence on foreign companies ➤ Adversaries (Pakistan) investing heavily in acquisition and development of defence equipment ➤ Indigenization of defence equipment through reverse engineering by China

Figure 6 SWOT analysis defence Industry

4.8 **Make-in-India and Private Sector**

The Modi government has no doubt taken a host of initiatives to incentivise the private sector's participation in defence production. These include raising the FDI cap, streamlining the Industrial Licensing process, opening up government-controlled testing facilities, articulating export promotional measures, extending ERV benefits to private sector and ensuring a level playing field in terms of duties and taxes between public and private sectors. However, there are a slew of other issues listed below that need to be addressed by the Govt (L. Kumar, 2016)^{xii} :-

4.8.1 **Lack of Conducive Financial Framework** Many governments offer a variety of fiscal and other incentives to support and strengthen the defence manufacturing sector, which is unquestionably important. The defence industry in India is hardly regarded as a strategic sector. The current duty/tax framework may prevent private sector investment in defence manufacturing.

4.8.2 **Private Sector's Demand for Incentives.** The advantages sought by the private sector defence industry are mostly related to lower financing costs, infrastructure status, and presumed export status for specific types of products. The inclusion of the defence industry in the infrastructure category would also help the industry's players in terms of tax breaks.

4.8.3 **Level playing field.** To give domestic producers an equal playing field, the Govt uses the Foreign Trade Policy (FTP) to grant deemed export status on a regular basis. This status is for 'encouraging import substitution and primarily includes the supply of items that would otherwise be allowed at zero customs duty.'

4.8.4 R&D is lacking. The Indian private sector's push into defence industry is likely to be hampered by R&D. The private sector's low contribution to defence R&D is a reflection of Indian industry's overall lack of R&D concentration. The government is partly to blame for the industry's lack of incentives.

4.8.5 Skill Deficiency. Unlike the public sector, which is more established and has a more skilled workforce, the private sector does not yet have the manpower required for a high-end industrial industry such as defence. Thus the need for skill training of workforce from private sector is needed.

4.8.6 Delay in Acquisition Process Despite the fact that the government has opened a slew of big-ticket projects to private sector participation, these projects are still in the early stages of acquisition process. According to the DPP, it takes between two and three years to grant a project. The industry is more harmed by delays and frequent cancellation/retraction of tenders since the efforts put in to reach a certain level goes waste.

4.8.7 FDI. The majority of FDI proposals are either FII/FPI investments (which do not bring in technology per se) or changes to existing shareholding patterns. Foreign defence industries have so far refrained from investing in new joint ventures in India. In various interactions, the representatives of the foreign companies have voiced their concern about lack of assurance from the Indian government to make the JVs viable, they must be given an assurance of order to make the inflows financially viable.

4.8.8 Lack of Representation at Defence Ministry. The private sector believes that the MoD is biased in favour of DPSUs. Senior MoD officials sit on the latter's governing bodies and would ensure that the PSUs are performing successfully. The government's continued use of nomination system, which violates its own commitment, is of concern for private sector.

4.8.9 The issue of payment terms. While MoD pays international corporations via irrevocable Letters of Credit (LC), the Indian private sector receives payments through the Defense Accounts Department of the MoD, which entails delay. Considering that Indian industry operates in a double-digit interest regime, such delay could add anywhere between 4-6 per cent to the capital cost. In DPP (now in DAP 2020), the time frame for making payment has been stipulated which should ease out this issue of private industries

4.8.10 Higher percentage of Indigenisation. Under the Buy and Make (Indian) procurement contracts, a 50 percent indigenization requirement is mandatory. According to the private sector, such a standard across all the platforms may not be realistic, especially in aircraft procurement, where local capability is the absolute minimum. Despite its 75-year existence, HAL still relies on foreign sources for 80-90 percent of its requirements.

4.9 **Methodology for induction of Private Sector**

It is a known fact that that private sector would not venture in a field where it will not be able to reap profits. Further more in case of defence sector, there will be competition against the DPSUs who have been in the said business since

independence and with the capital which was infused by the Govt. Thus there is a need to provide level playing field for the competition to become meaningful and result oriented. Here is the role of government to come up with measures to nurture the private sector. The policy of allowing indigenous private sector companies to enter into joint ventures with reputed arms manufacturers across the globe to bring in state-of-the-art technology in to the country is under implementation. There is a requirement of providing incentives by government to the private sector so as to encourage them for venturing into the defence sector. The Govt could provide incentives in form of initial grant, tax concessions, subsidies, land at concessional rates for setting up ancillaries, easy finance, assured power supply etc. The list is endless and it all depends on the Govt as to how much it can chip in with. To begin with all new entrants should be assured of minimal orders to enable them to survive in a competitive environment.

The readiness of the Private Sector. Despite the fact that India possesses the skill, talent, and technology to perform and deliver with high level of efficiency the industry has not been able to realise its full potential due to absence of stronger assurances by the Govt. This is so as the government and the military are apprehensive of the quality of the products and services provided by private companies. No industry would be willing to spend extensively in infrastructure unless the government can guarantee them a threshold of purchase orders so that the industry can initially break even and generate some medium to long term horizon. The private sector and the government must work together. The technologies developed by the DRDO are available. If the private sector collaborates and hires PSU facilities, it can be a win-win situation.

Need to implement PPP. In spite of the repeated plans of the Government to reverse the ratio of Indigenization/self-reliance the ratio still remains 70:30 in favour of meeting our defence needs through imports. The capability and capacity of the private industry is not being integrated towards building a robust and self-reliant defence industrial base in India. Industry groups have lobbied the Govt to allow the private sector to manufacture defence equipment on par with DPSUs and OFs, arguing that the private sector's entry should not be seen as a danger to the public sector's existence. Private industry thinks that there should be no favour or reservation for either public or private sector manufacturers.

4.10 Conclusion

To be recognised as a force to be reckoned with, the Indian private sector has come a long way from being a mere provider of parts, components, and raw materials to the public sector defence industrial units. Its ambitions to invest heavily, as well as its success in securing contracts against both domestic and foreign competitors, as well as its increasing share of defence exports, illustrate its competitiveness.

The need for participation by private industries in defence sector is urgently required. Private firms should be closely monitored. The Indian defence sector will flourish as long as private enterprises stay ethical and work in the national interest. India's defence industrial future is bright, and it's alignment with the Make in India mission will make India Atmanirbhar as a result of the combined efforts of private and public companies. The first step toward fulfilling Atmanirbhar and Sashakt Bharat's dreams is to encourage private sector in defence sector. India is on the verge of revitalising its defence industrial base by ensuring transparency in the awarding of defence contracts to private and public sector enterprises, as well as treating them equally.

CHAPTER V: ANALYSIS

The Govt has extensive infrastructure, facilities, and a highly skilled workforce. The private sector, on the other hand, will be able to handle cutting-edge technical improvements, to have effective managerial practises, marketing abilities, and to practise financial restraint in line with sound business and commercial standards. A combination of the two can capitalise on their unique strengths while reducing the dangers associated with their separate flaws. Adopting a PPP model that brings together the public and private sectors will pay off handsomely.

A committee of experts constituted by the MoD under the chairmanship of Shri Dhirendra Singh first mooted the Strategic Partnership model (**SP Model**). The goal of this strategy was to build long-term capability in the private sector in six strategic segments: aircraft/helicopters, warships / submarines, armoured vehicles, missiles, command and control systems, and essential materials. The recommendation was accepted by the MoD and a task force was formed under the chairmanship of Dr. V.K. Aatre to establish criteria for selecting strategic partners. In January 2016, the Task Force delivered its report to the MoD. Following this MoD released Chapter VII of the DPP-2016, titled Revitalising the Defense Industrial Ecosystem via Strategic Partnerships.

5.1 Strategic Partnership Model

Strategic Partnership Model (SPM). Acquisitions under the Strategic Partnership model refer to private Indian firms participating in 'Make in India' in defence alongside foreign OEMs and acting as a System Integrator. Strategic Partnerships (SP) will attempt to strengthen indigenous defence manufacturing capabilities

through the private sector. The SPM depicts a long-term connection with reciprocal commitments and support over an extended length of time, minimising procurement time and uncertainty for both parties. Only a long-term contract between the MoD and the SP could have made this possible. In the following paragraphs few of the variances^{xiii} are discussed (2018):-

Back to L1 model.

(a) For SPM, Expert Committee clearly recommended the cost plus funding approach which envisages remuneration to the manufacturer or vendor consisting of the manufacturer's costs and a guaranteed percentage of profit. It went on to say that the lowest bidder model based on commercial bid invitations was undesirable and should be avoided. The cost plus model appears to be favoured by Task Force as well. While describing this procurement strategy, the SP Chapter states that it will necessitate long-term investments in manufacturing infrastructure from private sector partner.

(b) Due to the inherent uncertainties, no long-term investment will be made by any vendor if the procurement remains a one-time exercise based on one single contract. New items can only be developed with a long-term cost-plus framework. There is little incentive for R&D investment in a competitive setting where each procurement is conducted through a specific RFP, with one company winning one RFP and another entity getting the next in the same segment. In a competitive bidding scenario, suppliers try to cut costs everywhere they can, and R&D costs are the first to go. In this circumstance, the Indian industry would never be able to produce its own products and will always be reliant on foreign players.

(c) This was intended to change with the SP Model. Despite the fact that SP Chapter maintained the expectation of long-term investments, it removed what was supposed to be the key motivation for such investments the cost plus model contrary to the recommendations. In terms of the SP Chapter, the strategic partner will be chosen based on the lowest bid segment wise. This simply means that the contract will be awarded to the bidder who offers the lowest price (L1). The transition from a cost plus to a lowest bid model has resulted in the long-term SP Model being changed to an item-by-item or contract-to-contract procurement, which is similar to the present system under buy and buy and make structures. Consequently, such a model will have all the flaws with which the current procurement procedure suffers.

Assured orders: The Missing bedrock of the SP Model

(a) Following the issue of pricing technique, the second major source of concern is orders from the MoD, which are unexpected and plagued by delays. The SP Model was advocated on the assumption that the MoD would provide guaranteed orders, and that a private sector might finance and produce state-of-the-art items for the Indian armed forces based on these guaranteed long-term orders. The Indian SP was anticipated to construct a significant eco-system and a defence manufacturing infrastructure in the private sector as part of this process. The SP Chapter fundamentally undermines this idea, proposing an RFP to RFP or contract to contract paradigm instead of a long-term engagement with multiple orders to one business. This departure, together with the question of pricing technique, completes the process of transforming the Strategic Partnership into a contract relationship, similar to the DPP's existing procedures.

(b) Regarding the concept of providing guaranteed long-term or repeat orders to incentivize the SP to invest in infrastructure and R&D, the SP Chapter clarifies that the SP will not be given any preference, that no repeat orders will be given to the SP, and that the SP will have to compete like any other player. Why would the SP invest even a single rupee more than is required to fulfill the one contract handed to it in such a situation?

Merely a Policy Statement

The third debilitating weakness in the SP Chapter relates to the content and the spirit of the chapter. The MoD had announced its intention to introduce a new strategic partnership model of procurement well in advance. A number of procurements have failed because the vendor and the MoD were unable to achieve an agreement on the procurement contract. MoD is hesitant to change the standard form of contract under the relevant DPP, and this sparsely populated standard form of contract frequently fails to capture the nuances of modern contracting, resulting in parties refusing to sign the procurement contract even after the lowest bidder (L 1) has been short listed. In this environment, it was vital that the MoD not only made a policy pronouncement about the SP Model, but also provided all of the necessary wherewithal.

5.2 G2G Procurement : New Concept for Defence Acquisitions

The previous section tries to identify the leading reasons why the SP Model in its current avatar is unlikely to be the answer that the country has been looking for in relation to defence sector acquisition.

Russia has always been India's main provider of defence supplies. In recent years, the United States and Israel, as well as France and Germany, have pushed in their equipment. In terms of procurement mechanisms, Government to Government (G2G) procurement has proven to be the most efficient and effective. Although tender-based competitive bidding has a considerable advantage but it is this method of procurement that is responsible for the majority of pre-contract signing delays.

5.2.1 Why G2G Procurement?

Procurement delays and issues have been caused by the procedure set forth in the DPP. The procurement procedure outlined in the DPP is bypassed by the G2G procurement. As a result, the government of the day relies on the G2G route to meet the armed forces' important and urgent needs. Only non-critical and mundane products should ideally be purchased under the DPP.

As a result, in addition to having strong sales and marketing teams, all defence manufacturers around the world require strong liaison and lobbying teams to work with their own governments so that these foreign countries can make proposals to the GoI at the highest levels and close G2G deals. As a result, if the MoD wishes to speed up purchase of major equipment, the G2G method is likely to remain the favoured route, and foreign vendors must rely on their strong links with home country governments to succeed in India.

5.2.2 Criteria for Acquisition of equipment under G2G route

Occasionally, when participating in joint international exercises, our Armed Forces identify equipment with proven technology and capabilities belonging to a friendly foreign government. Such equipment can be obtained from that

country, which may have it in stock, or through use of the country's standard contracting procedure. If there are several options, a delegation may be assigned to choose the one that best fits operational needs. Following are various options available for defence forces:-

(a) There may be cases where a very large value weapon system / platform, which was in service in a friendly foreign country, is available for transfer or sale. Such procurements would normally be at a much lesser cost than the cost of the original platform/ weapon system mainly due to its present condition. In such cases, a composite delegation would be deputed to ascertain its acceptability in its present condition. The cost of its acquisition and its repairs / modifications would be negotiated based on IGA.

(b) In certain cases, there may be a requirement of procuring a specific state of the art equipment/platform, however, the Government of the OEM's country might have imposed restriction on its sale and thus the equipment cannot be evaluated on NCNC basis. Such equipment may be obtained on lease for a specific period by signing an IGA before a decision is taken for its purchase.

(c) In cases of large value acquisition, especially that require product support over a long period of time, it may be advisable to enter into a separate IGA (if not already covered under an umbrella agreement covering all cases) with the Govt of the country from which the equipment is proposed to be procured after the requisite inter-ministerial consultation. Such an IGA is expected to safeguard

the interests of the Govt of India and should also provide for assistance from the foreign Govt in case the contract(s) runs into an unforeseen problem.

(d) In certain acquisition cases it may be expedient to procure equipment from friendly countries by sale/lease/otherwise ex their own stocks. In such cases, G2G Agreements at appropriate level would be established to facilitate the issue of such stores. Care, however, would be exercised to ensure that adequate residual shelf life remains available for our Armed Forces. In such cases a technical delegation may be sent to check the condition of the equipment being offered.

5.2.3 Strategic Considerations for G2G by India. DPP contains particular rules that allow for procurements based on special factors. There may be times when procurements must be made from friendly foreign countries, which may be necessary due to geostrategic benefits that will be gained by our country. Such procurements would not follow the Standard Procurement Procedure and the Standard Contract Document in the traditional sense, but instead would be based on stipulations agreed upon by the governments of both nations. Following CFA approval, such procurements will be made through an Inter-Governmental Agreement (IGA).

5.2.4 Playing safe with G2G Deals.

The G2G deals^{xiv} (Behal, n.d.) apparently are the safest method of purchasing arms due to absence of middlemen, with no chance of corruption and it also

safeguards the interest of the nation, but it contradicts the basic essence of DPP i.e. single vendor purchases.

The G2G agreement, also known as the Foreign Military Sales (FMS) programme or Inter-Governmental Agreements (IGA), is a country's programme for transferring or selling defence equipment, articles, services, and training to other foreign governments and international organisations. A comparison of competitive procurements and G2G shows that in recent years, India has used this method for the majority of its deals. MoD is using this way to make up for a deficiency in overall equipment and readiness profile of the services. G2G procurements, have mainly been from three countries Russia, the US and Israel, though the upcoming countries like France & Germany are also taking this route; however the US has the major portion of the G2G pie.

5.3 **G2G : Purchases from Various Countries**

Status on the procurements effected from these countries ^{xv} (Behal, n.d.) are as given in the subsequent paragraphs.

5.3.1 G2G Purchases from US. As of now, India had become US's second largest Foreign Military Sales (FMS) customer with \$4.5 billion in total FMS sales. The trade between the two countries over the last decade has been to the tune of over \$10 billion, both through the FMS and the Direct Commercial Sales (DCS) route. The equipment and platforms procured by India from the US includes aerial cargo and surveillance platforms, land-based radars, ship-based helicopters, weaponry, engine technology, and one amphibious transport dock (ex-USS Trenton), Heavy lift and attack

helicopters. The industry trends indicate that this trade could touch \$25 billion over the next decade. The projected deals under the FMS programme in coming years include Hawkeye E-2D Aircraft, Self Protective Suite, 4 more P-8I Maritime Patrol Aircrafts, Additional Harpoon block II Missiles for additional P 8Is, Special Operating Forces Unique Equipment, Aegis Missile Defence System, 16 Multi-Role, New Generation Carrier-Based Fighter Aircrafts, 4 ANTPQ 37 Fire Finder Counter Battery Radars, Submarine Deep Sea Rescue Vehicle case and Engines for Jaguar Aircrafts.

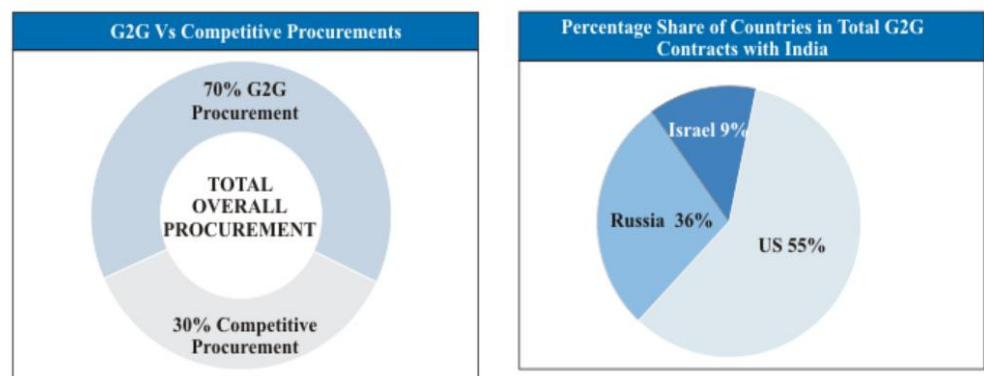


Figure 7 G2G V/s Competitive Procurements and percentage share of countries
Source: <https://defproac.com/?p=3961>

5.3.2 G2G Purchases from Russia. As for the G2G deals, these include lease of Nerpa Nuclear Submarine, Sale of Aircraft Carrier Admiral Gorshkov , Purchase of 310 T-90 tanks, 25,000 Invar and 10,000 Konkurs anti tank missiles, 42 Advanced MKI Sukhoi. Recently, India has gone ahead with the purchase of five S-400 Triumf air defence missile systems worth Rs 40,000 Crores through G2G route. Also, in the offering are two Varshavyanka-class diesel-electric submarines and Nerpa submarine on lease through this route.

5.3.3 G2G Purchases from Israel. Both countries have also sealed some G2G procurements in the past. These include: 40,000 rounds of 155 mm ammunition, 160 mm mortars, nine Barak-I AMD systems along with 200 missiles, Phalcon radars and upgrade of 160 Heron and Searcher UAVs.

5.3.4 G2G Purchases from France. India having procured 36 Rafale fighter aircrafts worth around \$8.56 Billion for IAF with an option clause of 20 more, it is through G to G route.

5.3.5 G2G Purchases from Germany. Germany has recently has offered ThyssenKrupp Marine Systems (TKMS) developed 214 Class Submarine to India through G2G deal for P75 (I) programme worth over Rs 60000 Crores under which six conventional submarines are to be built in India for the Indian Navy.

Implications of FMS/G2G route.

For complicated weapon systems, the G2G method is preferable since India ^{xvi} (Behal, n.d.) can have them properly integrated and configured. While the FMS/G2G approach relieves the MoD of the difficult considerations associated with competitive bidding, it effectively blocks the buyer's leverage. Though the Indian government considers FMS/G2G to be a subset of DPP, it should be emphasised that the MoD's evident preference for single-vendor purchasing directly contradicts the DPP, which requires multi-vendor competition to reduce prices. Taking the FMS/G2G path for most of the purchases, on the other hand, will not only stifle the expansion of India's defence industrial base, but will also result in the loss of lively

participation from private sector. It will lose vibrant participation of Indian defence industry and of foreign defence manufacturers which may have better technology.

G2G agreements are aimed at cutting prices, they preclude multi-vendor competition. Furthermore, seller is not obligated to invest a portion of the sale as offsets in Indian industry, as required by the DPP for all competitive bids. Although the FMS/G2G approach provides the added benefits of set costs, sovereign guarantees, and after-sales assistance and thus it should only be used as an exception rather than the rule. It should be considered as a means of acquiring weapons and equipment for urgent military demands, rather than a way to avoid the tedium of competitive bidding.

FMS/G2G deals has no doubt played a pivotal role in strengthening the defence relations between the India and other nations especially US but this has made other countries like Europe and Russia worried and disappointed over the developments as they feel that trend of FMS/G2G deals is skewed against them, and in favour of US.

5.4 **Acquisition cases which have fructified under PPP**

A few instances wherein PPP model of acquisition was successful in defence sector thereby reinforcing the use of PPP form of acquisition ^{xvii} (Chander, 2019) are listed (Saxena, 2021) below ^{xviii} to highlight the importance of PPP for defence equipment.

- (a) **Multi-mode hand grenades (MMHG).** The first batch of Multi-Mode Hand Grenades (MMHG), manufactured by Economic Explosives Ltd (EEL) on PPP model has been handed over to the Indian Army on 24 August 2021 in the presence of Defence Minister.

(b) **The K9 Vajra.** On 10 Nov 20, report said that L&T has flagged off its 81st K9 Vajra-T howitzer from its Hajira facility and claimed with justified pride for completing the entire contract within the delivery schedule. This little news is actually big news. **It signals a ‘new norm’ where the private sector delivers and delivers in time.**

The OEM of this weapon is Hanwha Defense of South Korea. Some of the main weapons in the above package are the M777 155-mm, 39-calibre Ultra-Light Howitzers (ULH) from BAE Systems’ American subsidiary, Advanced Towed Artillery Gun System (ATAGS) as a Public-Private-Partnership (PPP) project between DRDO and the private industry and 155-mm, 45-calibre ‘Dhanush’ towed howitzer indigenously manufactured and inducted.

The contract was signed in May 2017 at Rs 4,366 crore. Riding on total technology transfer, of 100 howitzers, only the first 10 were to be received from Hanwha Defence as Semi-Knocked Down (SKD) packages to be assembled in India, and the balance 90 were to be ‘wholly made in India’. The schedule for the 100 was: 10 to be assembled from SDKs by Nov. 2018, 50 to be made by Nov. 2019, and the balance 40 to be made by Nov. 2020. It is incredible to note that the total schedule was 36 months (Nov 2017-Nov 2020). Six months were granted as ‘Force Majeure’ clause due to COVID-19. The total schedule became 42 months. (36+6 months). All the 100 artillery units were supplied well before the 42 months run out. This signals a new era. **An era that not only sees the rise of the Indian defence private sector, but also a new-found capability to deliver within time.**

(c) **M777**. The contract for 145 numbers of M777 was signed way back in Feb. 2016 between BAE Systems and Mahindra Defence Systems at a cost of Rs 5,060 crore. The OEM reposed faith in the Indian player who went ahead to establish in India, a full-fledged Assembly-Integration-Testing (AIT) facility for making M777 end-to-end, right here in India. AIT goes beyond its three alphabet acronym. It represents a global OEM reposing faith in the Indian player for producing his prestigious and signature weapon, totally in India. The faith is pursuant to a thorough check that the Indian partner will be able to maintain the type of quality and consistency that will qualify it to carry the BAE Systems colours. The AIT will not only serve the Indian contract but also, will become a future manufacturing hub for the worldwide supply of the weapon system. The M777 contract signed just prior to K9 envisaged that out of 145 howitzers on order, only 25 will come fully assembled, balance 120 will be made in India at the AIT facility near Delhi.

(d) **Pinaka Multi-Barrel Rocket Launch (MBRL) System.**

Development of the Pinaka MBRL commenced in 1986 at a DRDO facility known as the Armament Research and Development Establishment (ARDE). DRDO was responsible for the overall design and development. The sub-systems and components were developed by Tata Power Strategic Engineering Division (SED), Larsen & Toubro (L&T) and OFB. The weapon system is already in service with the Indian Army and is a **fine example of partnership between the public and private enterprises.**

(e) **The ATAGS.** This project has several firsts to its credit. It is the **first indigenous PPP project** of this magnitude ever signed in the history of

Indian defence procurement. Total requirement was approximately 2,000 ATAGS. The approved cost of 150 ATAGS by DAC in Aug. 2018 was Rs 3,364.78 crore. It is the **first PPP project where a public sector player has partnered with four defence majors in the private sector**. These are Bharat Forge Limited, Mahindra Defence Systems, erstwhile Tata Power Strategic Equipment Division (SED) and Punj Lloyd Limited. That the order of 150 ATAGS was shared between PPP players points towards the fact how each one has come out stronger in developmental journey starting 2013-14.

(f) **Navy's 3D Surveillance Radars** It was reported in Mar 2019 that Tata Power SED has signed a Rs 1,200 crore (\$163 million) contract with the MoD to supply 23 three-dimensional (3D) surveillance radars to the Indian Navy for ship-borne deployment, marking another success for the private sector. What is peculiar and heart-warming about this contract? The foreign OEM for this equipment is Indra Sistemas of Spain, but it is Tata Power SED, which is the prime contractor. It is an Indian player that has negotiated the contract with the MoD. This contract is processed under the category 'Buy and Make (Indian)' of DPP. In Dec. 2019, MoD issued a list of contracts awarded to Indian industry (both public and private) since 2014 when 'Make in India' got going. It quotes a huge figure of Rs 196,000 crore (\$2.6 billion) spread over 180 contracts.

(g) **INS Arihant** [Ship Submersible Ballistic, Nuclear (SSBN) Submarine]. The INS Arihant is the lead ship of India's Arihant class of nuclear-powered ballistic missile submarines. The project was launched in 1997 and was jointly developed by the Indian Navy, Bhabha Atomic Research Centre (BARC) and DRDO at the naval dockyard in Visakhapatnam. Russian

designers assisted in building the vessel. Domestic private companies involved in development of the submarine were Tata Power, a division of Tata Group; L&T, and Walchandnagar Industries. The **submarine was successfully delivered under the PPP model** and commissioned in the Indian Navy in August 2016.

(h) **Launch Vehicle for Nirbhay Missile System** Nirbhay, a sub-sonic cruise missile which is under trial, is launched from the LPTA 5252-12 x 12, an all-terrain and all-wheel drive mobile launch vehicle. The launcher was developed jointly by Tatas in close coordination with Vehicles Research and Development Establishment (VRDE) at Vahannagar.

A perusal of the list brings out that while a major chunk of the contracts have, of course, gone to the public sector, quite a significant share has been bagged by the private sector as well. Some figures:-

Public Sector: Rs 45,000 crore contract for Mazagon Dock Shipbuilders Limited and Garden Reach Shipbuilders and Engineers Limited for seven stealth frigates, Rs 19,100 crore contract for OFB for 464 T-90 battle tanks, Rs 14,100 crore contract for HAL for 28 Dorniers, Rs 6,300 crore for BEL for seven squadrons of Akash air defence missiles and Rs 7,900 crore for BEL for IAF Integrated Air Command and Control System (IACCS) nodes.

Private sector: Rs 4,300 crore for L&T for 100 K9 Vajra artillery guns; Rs 1,200 crore to Tata Group for naval radars; and Rs 5,060 crore for Mahindra Defence Systems for the 145 M777 Ultra Light Howitzer.

5.5 Comparison G2G & PPP models for Defence Acquisition

From the perspective of self-reliance and ‘Atmanirbhar Bharat’, India has a reason to cheer, as realisation dawns that nation’s private sector in defence manufacturing is finally arriving in more than one way. In next five years, private sector's participation in defence modernization and production will grow. If the G2G and PPP are compared, then PPP will be the superior choice for the Indian context since private industries will gain and there will be growth in all associated sectors, economic development will occur, and exports will be possible after the industry is established. In the case of G2G, however, this option will be unavailable, and the equipment will be procured without the benefit of involving private actors.

5.6 Analysis of Responses Received against Questionnaire

SERVICE/ DEPARTMENT/PROFESSION

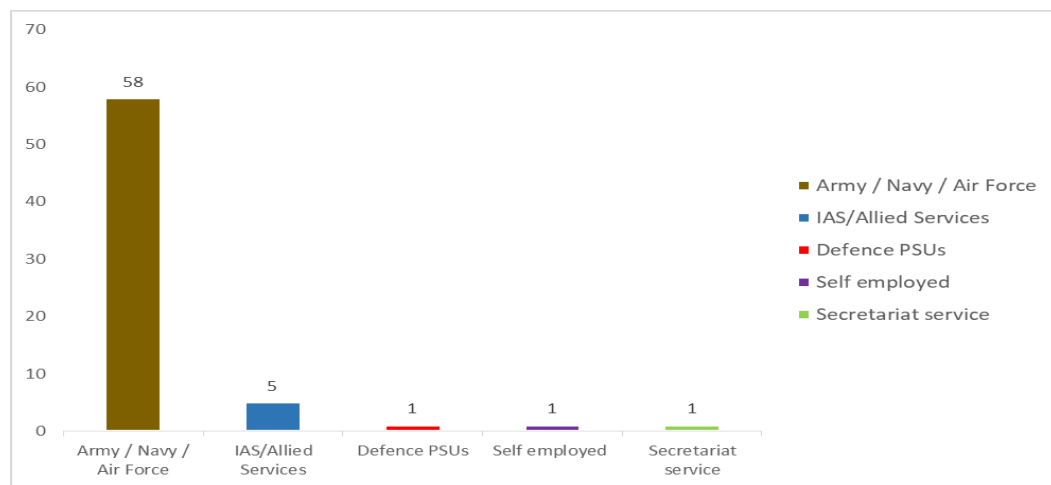


Figure 8 Response to Ques on Service/ Department/Profession

Inference.

Response was received from 66 respondents. Majority of them are from Defence services (Army/ Air Force / Navy), few from IAS/Allied services and one each from Defence PSU, self employed and from Secretariat service. Most of the respondents have put in more than 20 years of service in their respective departments.

Q1. Keeping in view the security scenario, Indian Defence sector needs to become self-reliant

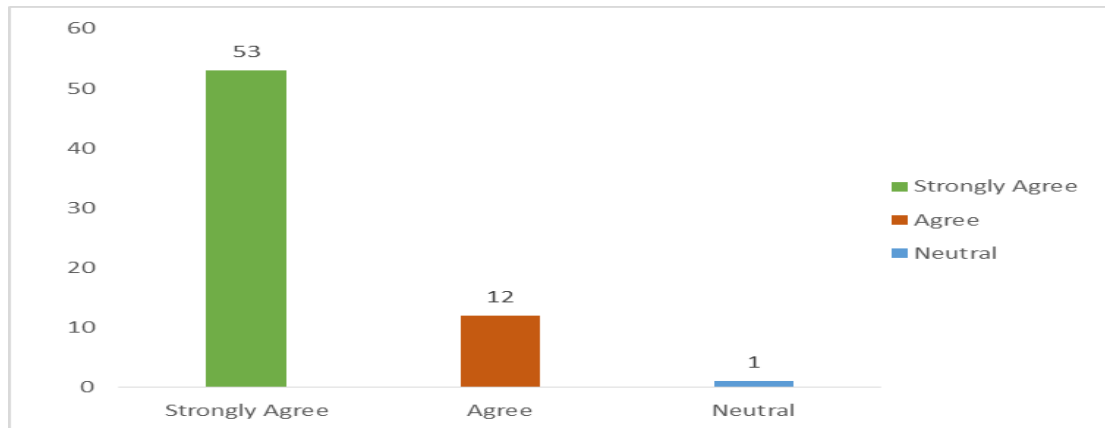


Figure 9 Response to Ques on Self Reliance

Inference

Almost 80 % (53) of the respondents strongly agree, 18 % (12) agree and balance 2 % (1) is neutral to the issue on Indian Defence Industry becoming self reliant

Q2. Public Private Partnership (PPP) model has been implemented and has worked satisfactorily for development of highways, railways, airports, power etc. It is time that PPP model should be implemented for acquisition of Defence equipment

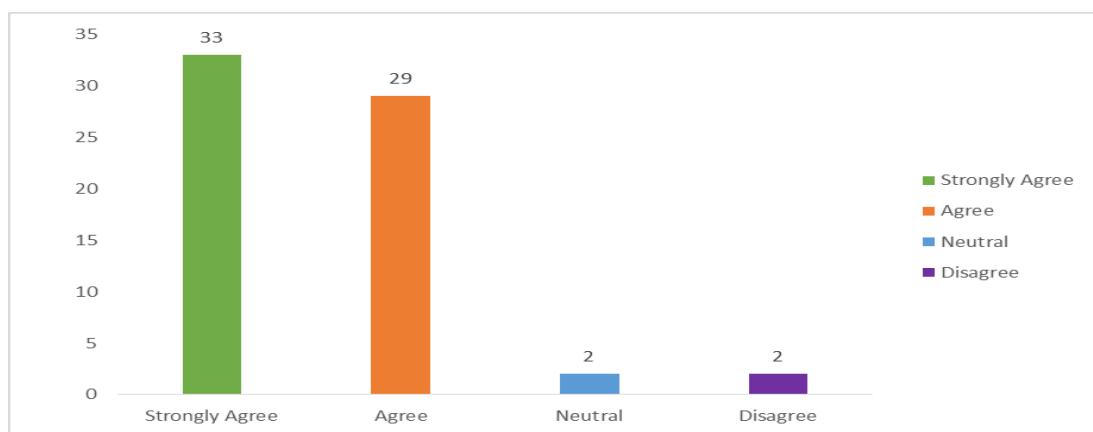


Figure 10 Response to Ques on PPP model for Defence sector

Inference

Almost 50 % (33) strongly agree, 44 % (29) agree whereas balance 3% each are neutral and disagree with the proposition.

Q3. Defence PSUs are not performing at the pace and level as required by the Armed Forces

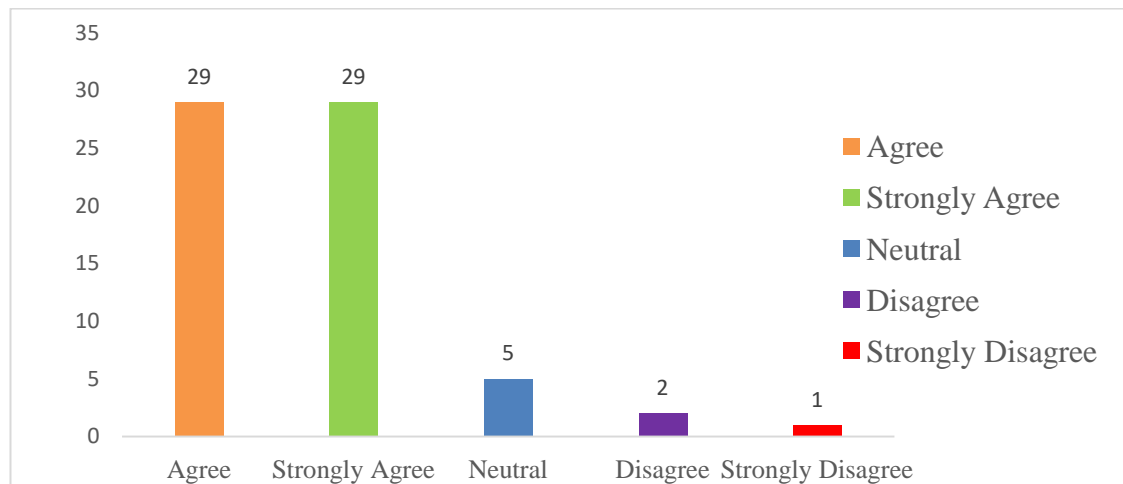


Figure 11 Response to Ques on Non-Performance of DPSUs

Inference

44 % (29) strongly agree and 44 % (29) agree whereas balance 8% (5) are neutral with their opinion, 3 % (2) disagree and 1 % (1) is in strong disagreement.

Q4. Through PPP model, India will be able to develop its industrial base for Defence equipment.

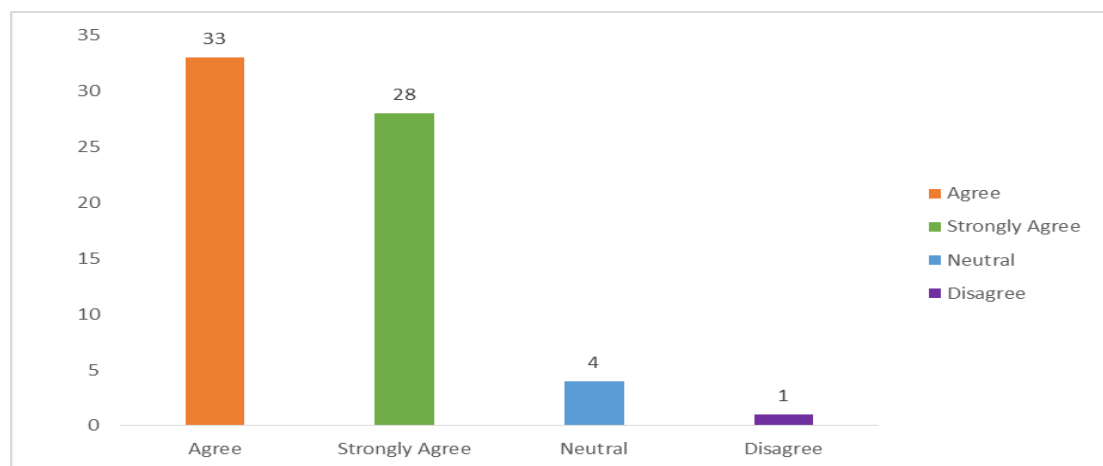


Figure 12 Response to Ques on development of Defence Industrial Base

Inference

On above issue, almost 50 % (33) strongly agree and 43 % (28) agree. Balance 6% (4) are neutral with their opinion and 1 % (1) disagree to this aspect.

Q5. Integration of Public and Private sector would enhance the acquisition of Defence Equipment

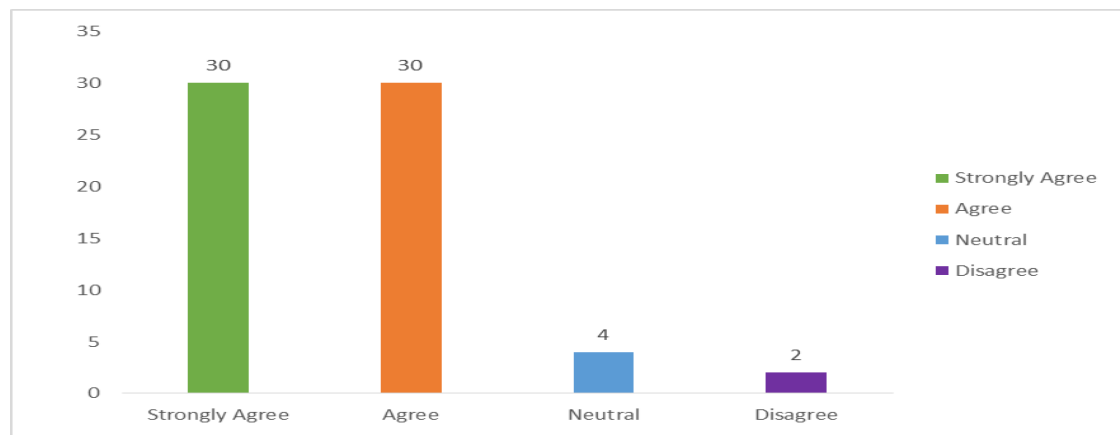


Figure 13 Response to Ques on Integration of Public and Private sector

Inference

On the above issue, 45 % (30) strongly agree and 45 % (30) agree. Balance 6% (4) are neutral with their opinion and 4 % (2) disagree.

Q6. Increase of FDI limit to 74% would lead to faster acquisition of Defence Equipment

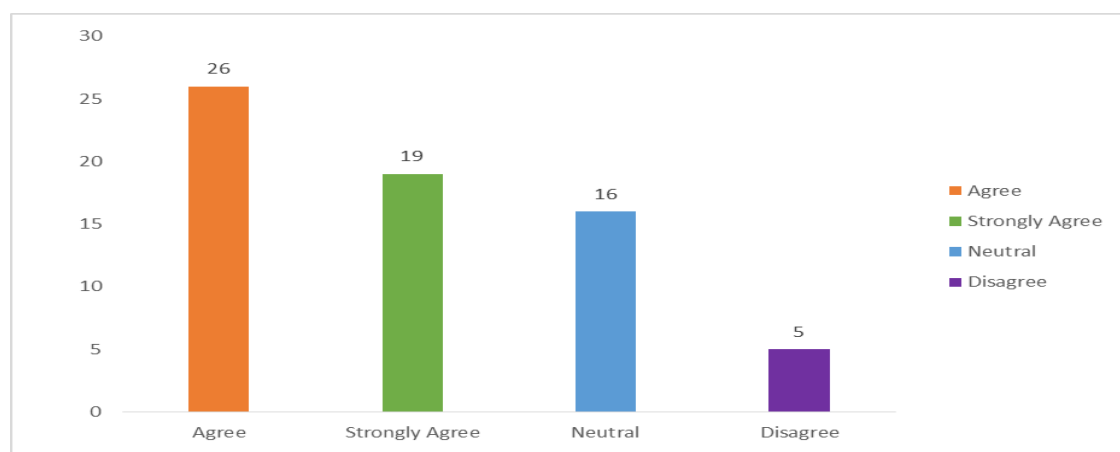


Figure 14 Response to Ques on Impact of increase in FDI limit

Inference.

On the above issue, 39 % (26) strongly agree and 29 % (19) agree to this aspect. Balance 24% (16) are neutral with their opinion and 11 % (5) disagree.

Q7. Involvement of private sector is necessary in order to enhance the acquisition of defence equipment.

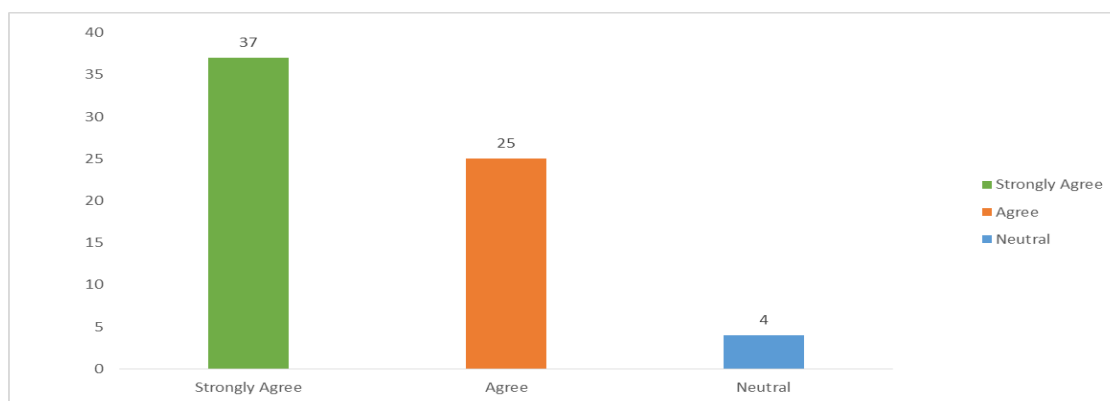


Figure 15 Response to Ques on more involvement of private sector

Inference

On this issue, 56 % (37) strongly agree and 38 % (25) agree. Balance 6% (4) are neutral with their opinion.

Q8. PPP in defence manufacturing is likely to capitalise on strengths of both public as well as private sectors while mitigating the risks on account of their individual weaknesses?

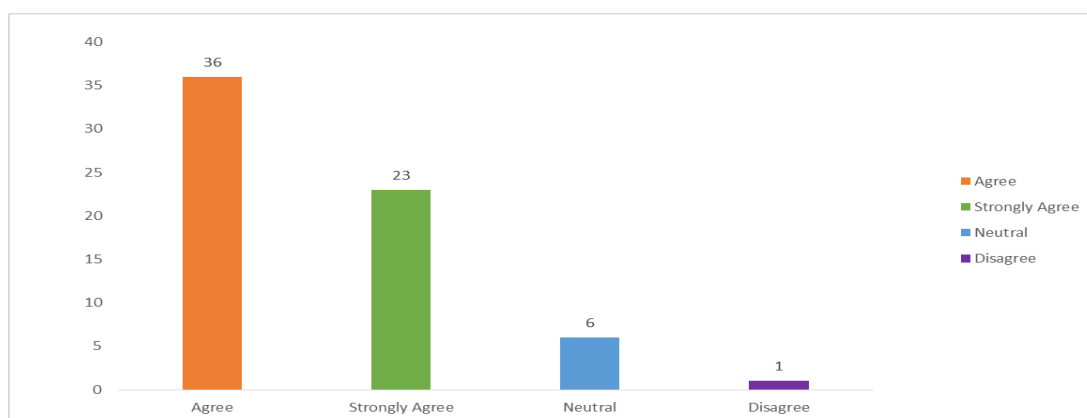


Figure 16 Response to Ques on integration of public and private sector

Inference

On the above issue, 55 % (36) agree, 35 % (23) strongly agree and balance 9% (6) are neutral with their opinion while 1% (1) is in disagreement with this statement.

Q9. Adoption of PPP model will enhance efficiency of defence manufacturing sector and make it more competitive

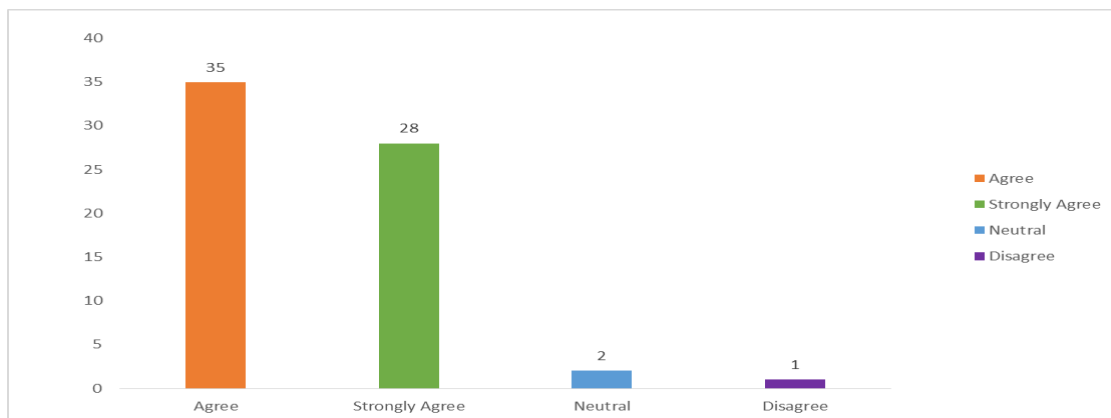


Figure 17 Response to Ques on effect of PPP on mfg sector

Inference

On this aspect, 53 % (35) agree whereas 42 % (28) strongly agree. Balance 3% (2) are neutral with their opinion and 1% (1) is in disagreement.

Q10. Adoption of effective PPP models with concepts like Make in India, Atmanirbhar Bharat etc are likely to take India forward towards realising goal of self - reliance?

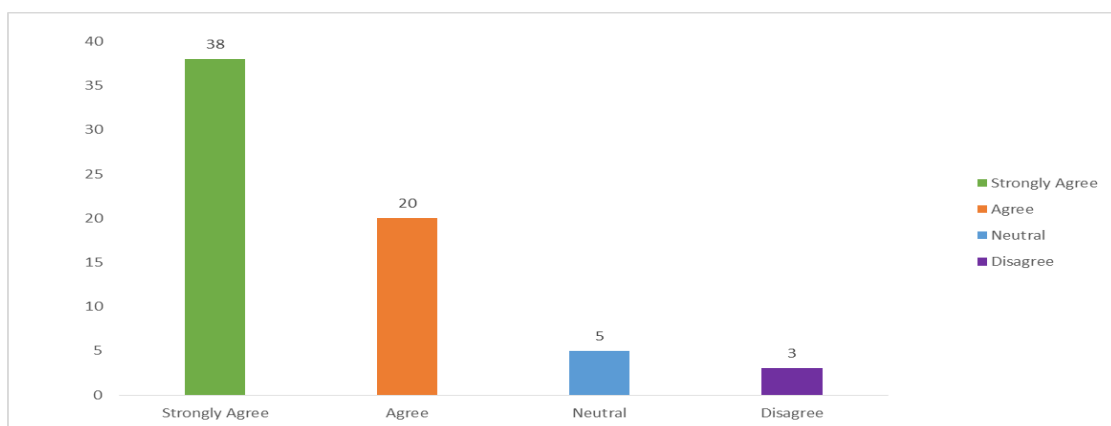


Figure 18 Response to Ques on due to implementation of concepts

Inference

58 % (38) strongly agree whereas 30 % (20) agree to this aspect. Balance 8% (5) are neutral with their opinion and 4% (3) are in disagreement.

Q 11. PPP will enhance the potential of SMEs.

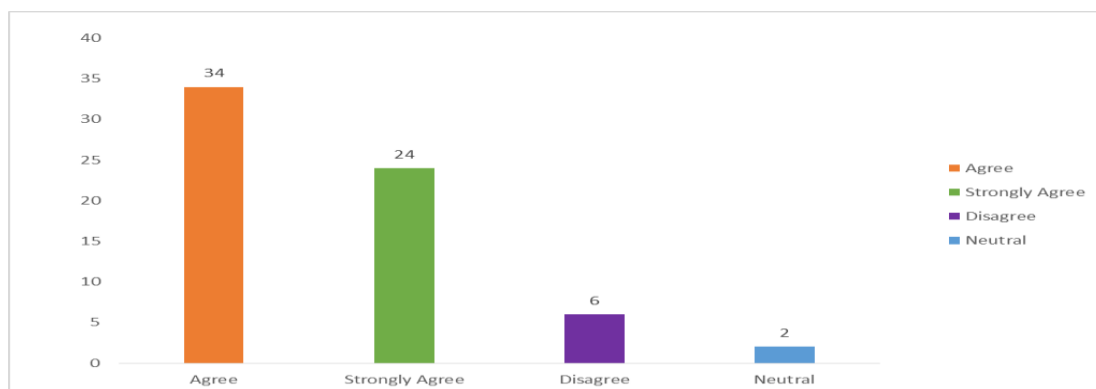


Figure 19 Response to Ques on effect of PPP on SMEs

Inference

On the above issue, 52 % (34) agree whereas 36 % (24) strongly agree, balance 9% (6) are in disagreement and 3% (2) are neutral with this statement.

Q 12. A number of committees were set up to give out recommendations for self-reliance in defence production by effective PPP. There is an emergent need to implement their recommendations in time bound manner.

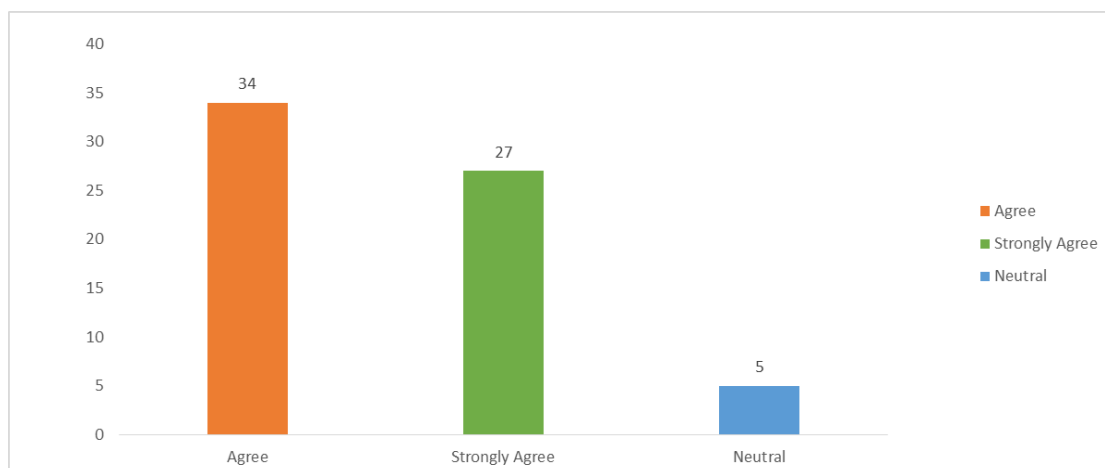


Figure 20 Response to Ques on implementation of recs of committees

Inference

On the above issue, 52 % (34) agree, 41 % (27) strongly agree and 7% (5) are neutral with this statement.

5.7 Statistical Analysis of collected Primary Data

Primary data was collected from respondents based on the questionnaire designed on 5-point Likert scale as already brought out before. The individual questions have already been presented with the descriptive statistics highlighted. Further, the questions also have been used as a Summated Scale to measure the construct “THE NEED TO STRENGTHEN PPP STRUCTURES IN DEFENCE”.

Before initiating such construct formulation, the reliability check has been carried out using SPSS software. All aspects of inter-item correlations and covariances and KMO tests have been scrutinised and Reliability of scale has been verified using Cronbach’s Alpha. The results of the same are appended below.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.866
Bartlett's Test of Sphericity	Approx. Chi-Square	354.162
	df	66
	Sig.	.000

KMO test value of 0.866 indicates high sample adequacy and Bartlett’s test is significant at P-value <0.001.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.875	.881	12

Cronbach’s Alpha Value of 0.875 indicates high reliability of the scale using the 12 items in the questionnaire.

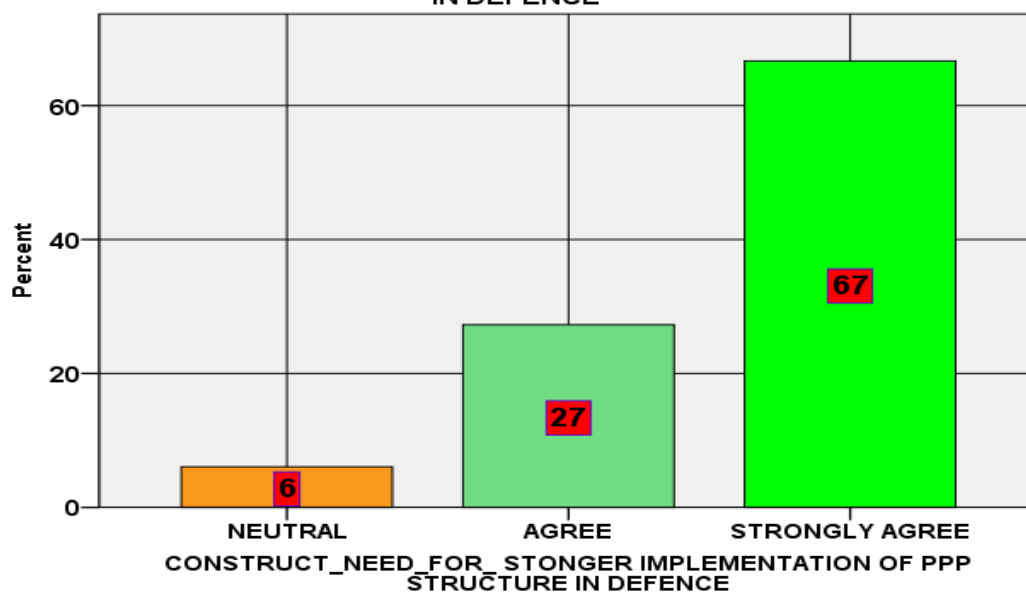
Having established the reliability of the scale and the formulation of the construct, the descriptive of new variable is presented below. The same have been analysed using EXPLORE option available in SPSS

Descriptives

			Statistic	Std. Error
CONSTRUCT_NEED_FO R_PPP	Mean		4.3333	.05755
	95% Confidence Interval for Mean	Lower Bound	4.2184	
		Upper Bound	4.4483	
	5% Trimmed Mean		4.3649	
	Median		4.3333	
	Variance		.219	
	Std. Deviation		.46754	
	Minimum		2.92	
	Maximum		5.00	
	Range		2.08	
	Interquartile Range		.69	
	Skewness		-.884	.295
	Kurtosis		.810	.582

The frequency distribution of the construct in terms of percentage is shown below.

CONSTRUCT_NEED_FOR_STONGER IMPLEMENTATION OF PPP STRUCTURE IN DEFENCE



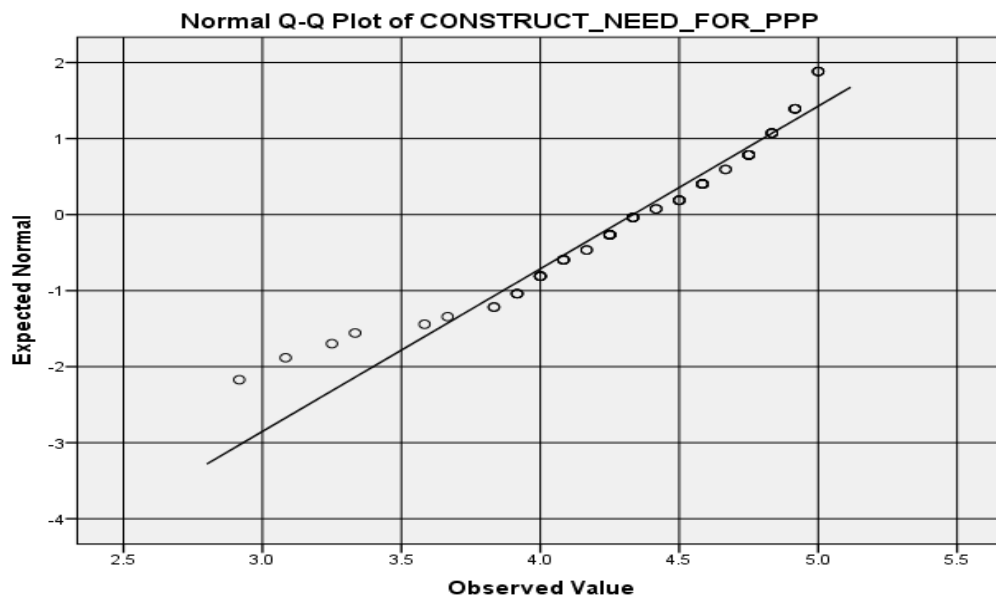
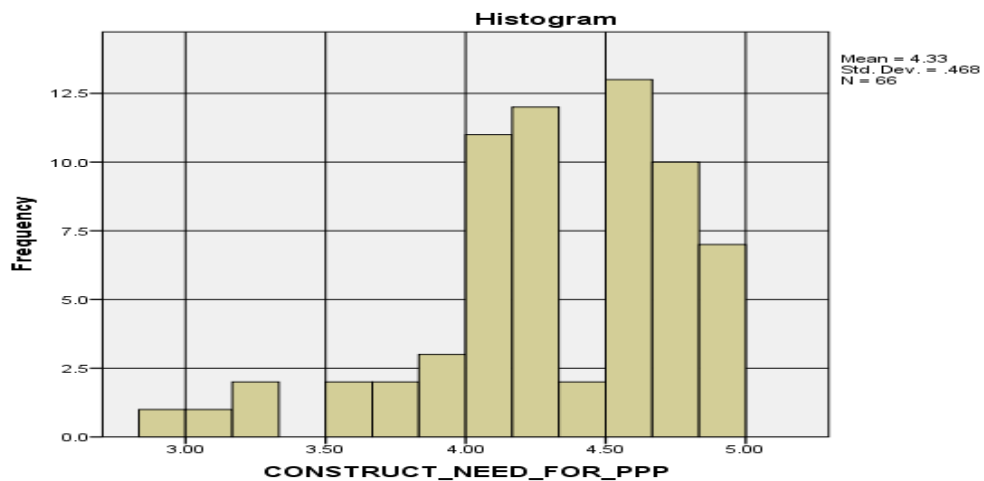
In order to carry out inferential statistical analysis of this variable, it is essential that the variable is checked for normality. Normality test using Kolmogorov-Smirnov Test was carried out and is not significant at P-value=0.197.

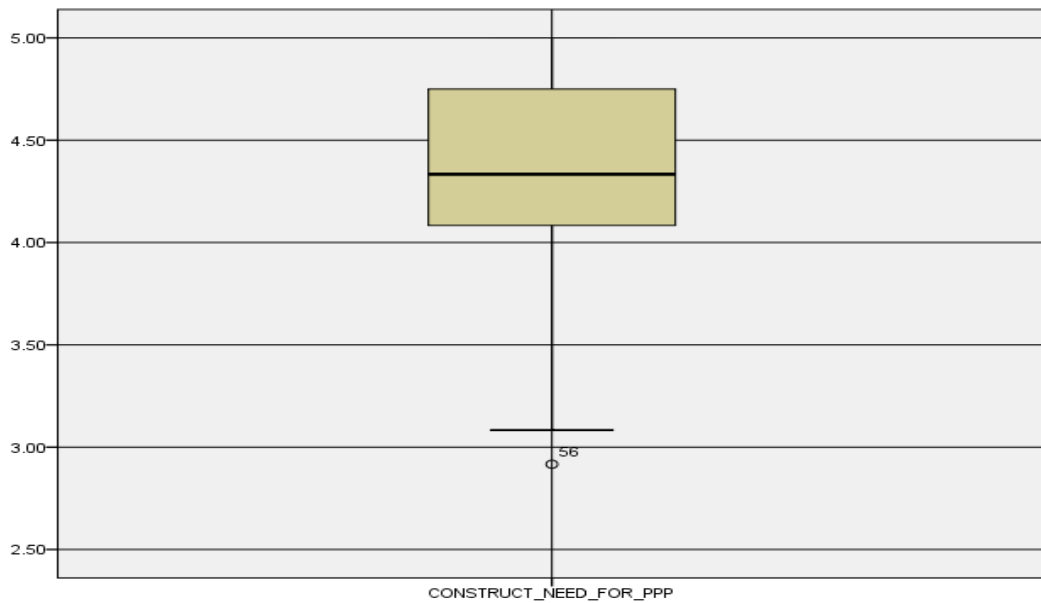
Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CONSTRUCT_NEED_FO R_PPP	.098	66	.197	.938	66	.003

a. Lilliefors Significance Correction

In addition, normality was checked with Histogram, Normal Q-Q plot and Box plot as shown below.





All these also confirms that the variable(Construct) is approximately Normally distributed thereby is amenable to Inferential Statistical Analyses.

One Sample t-test

In SPSS, both z-test and t-test are carried out using “One Sample t-test”. The same was carried out to test whether any significant difference exists in population as to the need to Strengthen the PPP structures in Defence Sector. The results are shown below.

One-Sample Test						
	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
CONSTRUCT_NEED_FOR_PPP	23.168	65	.000	1.33333	1.2184	1.4483

The test gives t-statistic value =23.168 with significance-value less than 0.001 and the mean varying between 4.21 and 4.45 which clearly indicate that there is no significant difference among the population.

Oneway-ANOVA

Oneway-ANOVA was carried out to see whether the different demographic groups differ in their perception. Also Multiple Comparison was carried out using Tukey HSD. The results are shown below.

ANOVA

CONSTRUCT_NEED_FOR_PPP

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.698	2	.349	1.628	.204
Within Groups	13.510	63	.214		
Total	14.208	65			

F=1.628, P-value =0.204, the test not significant meaning there is no significant differences among various groups. Tukey HSD as well as Homogenous sub-sets also points to the same inference

Multiple Comparisons

Dependent Variable: CONSTRUCT_NEED_FOR_PPP

Tukey HSD

(I) SERVICE	(J) SERVICE	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
DEFENCE	IAS	.38509	.21599	.184	-.1334	.9035
	OTHERS	.09759	.23953	.913	-.4774	.6725
IAS	DEFENCE	-.38509	.21599	.184	-.9035	.1334
	OTHERS	-.28750	.31064	.626	-1.0331	.4581
OTHERS	DEFENCE	-.09759	.23953	.913	-.6725	.4774
	IAS	.28750	.31064	.626	-.4581	1.0331

CONSTRUCT_NEED_FOR_PPP

Tukey HSD^{a, b}

SERVICE	N	Subset for alpha = 0.05
		1
IAS	5	3.9833
OTHERS	4	4.2708
DEFENCE	57	4.3684
Sig.		.303

Means for groups in homogeneous subsets are displayed.

- Uses Harmonic Mean Sample Size = 6.417.
- The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

As already highlighted above the tests point to the inference that there is a definite requirement to focus on and strengthen the PPP structures in Defence Sector.

5.8 Conclusion

GoI is taking serious measures to improve and ensure that Long-term defence planning and project classification should include the private sector to enable them to map their capabilities, organise their investments, and supply chain accordingly. The easiest way is through G2G/FMS route which does not call for procedure to be followed as laid down in DPP . It can be used to meet specific or urgent needs of the defence.

In case there is shortfall and some equipment are required on urgent priority then G2G route can be followed for limited and urgent requirement. For defence acquisition and for economy to develop and for development of industries, the better option would be to go in for PPP mode for acquisition which would benefit all the stakeholders.

Chapter V1: RECOMMENDATIONS

Acquisition of defence equipment is costly, complicated, and has a direct impact on national security. The need of the hour is for a more integrated and enabling approach to defence procurement, as well as a shift in the MoD position from regulator to facilitator. Armed Forces require procurement of defence equipment in a timely and cost-effective manner in order to provide them with the capabilities needed to achieve national goals and counter any threats to national security. What to buy, where and who to buy from, how to acquire, and how to monitor are all various aspects of defence acquisition.

6.1 Acquisition Enablers

An effective and efficient long term defence plan flows from comprehensively defined National Security Objectives and National Security Strategy. However, it is only in India where the defence planning cannot be formally linked with national security strategy because the country does not have a strategy. The plan for defence capability buildup is based on RMs directive, which is not available in public domain.

6.2 Recommendations for Govt

Few recommendations which are required to be considered by Govt are given in the succeeding paragraphs ^{xix}

- (a) **Encourage the formation of PPPs.** There is a need to promote engagement and long-term cooperation between public and private sector enterprises / organisations. Both sides' strengths and faults must be acknowledged and collaboratively addressed. The private sector's unique

strengths and experience must be tapped upon and given proper consideration. To provide hand-holding to the private sector, there should initially be a demarcation of manufacturing tasks between the private and public sectors, at least for a few years.

(b) **Encourage export of military hardware.** The government should support the export of defence equipment for which the DPSUs/OFs(now corporations)/private sector have adequate knowledge. Incentives for the industry could also be considered in this area.

(c) **Academia and Research Institutes should be coopted.** To leverage their skills, expertise, and potential, the DRDO should involve academia, universities such as Indian Institutes of Technology, Indian Institutes of Science, and other technical institutes in defence research operations. Furthermore, the know-how available among India's technological diasporas must be used for R&D.

(d) **Defense Exclusive Economic Zones (EEZs) be established.** There is a need to establish exclusive economic zones devoted solely to defence industry. This will offer the much-needed coordinated push for the defence industry's expansion.

(e) **Bureaucratic Control needs to be loosened.** As much as possible, the government should stay out of the defence industry as a maker and controller. Rather, it should serve as a regulator and facilitator for the development of the country's defence industry.

(f) **Incentives for Defence Industry.** In order to make the indigenous defence industry more profitable and promote faster growth in the defence sector, incentives must be provided. These could take the shape of a national award for achievement, tax breaks for the private sector, freedom to export the created goods, easy access to capital, and the allocation of land, among other things.

(g) **Vendor Development.** In almost every situation, the finance department emphasises the importance of multi-vendor procurement for greater price discovery. The fact that there are just a few defence equipment/platform producers in the world and when we're looking for sellers in India to enable 'real price discovery,' the problem becomes even worse. This will also enable the adoption of the L1T1 model for the induction of high-tech systems and platforms, resulting in 'value for money'.

(h) **Private Sector's Performance.** The entire thrust is built on the belief in the private sector's ability to produce a high-quality product with life time support. Private sector participation can be directly boosted through demonstrated performance through strict adherence to quality in order to position itself as a vital player in India's defence industry.

(i) **Increase the domestic defence industry's capacity and capabilities.** India should work to improve its indigenous defence industry's capabilities and capacity. The goal should be to address the defence forces' requirement for indigenous modernization and upgradation of weapon systems and equipment.

(j) **Procedures take precedence.** Procedures are established to achieve a goal but in our acquisition process they have become a goal in themselves. Anything more, even at a low cost, is, for example, a big no-no. It's important to remember that there's a time limit between when a Statement of Case (SoC) is filed and when the Contact Negotiations Committee (CNC) is constituted to actually negotiate the contract. However, as per the current procedures nothing can be added even at this stage.

(k) **Accountability** (K, 2013) ^{xx}. Defence acquisition in India is handled by a number of separate organisations, each reporting to a different functional head. As a result, each acquisition must go through "a number of permissions and submission stages." This not only results in cross-validation in terms of overall planning and needs, but it also results in various perspectives and approaches among organisations at each step of acquisition, making it difficult to fulfill important acquisition functions efficiently.

(l) **Synergy within MoD** (K, 2013) ^{xxi}. Synergy between various branches of MoD is essential to properly induct equipment into Services. To progress the many parts of the induction, such as equipment, manpower, and infrastructure, coordination between the acquisition wing, the general wing, and the finance wing is required. An efficient and complete induction of the equipment into the Services will emerge from a coordinated effort from all wings of the MoD.

(m) **Organisation to investigate Allegations** We have one of the most thorough trial procedures, with so many agencies testing the same equipment. We require a single, independent organisation to quietly investigate an

allegation and determine, once and for all, whether the allegation or complaint should be ignored or addressed. People would be able to work with a clear mind and without dread of the three Cs ie CVC, CBI, and CAG. Individual accountability must be developed, and systemic flaws must be addressed in order for the system to function effectively.

(n) **Policy simplification.** To shorten the operational time frame, all policies should be harmonised and synchronised to a single window clearing procedure. This would help the government's ease-of-doing-business push in the defence sector.

(o) **Tax Incentives.** The government may consider granting the defence sector the infrastructure sector status, which would allow them to keep 100% of profits for a set period of time. Import duties on capital equipment are being reduced, and the country is now producing defence products.

(p) **Inclusive Development.** Advanced infrastructure, technical development and a functional fund to finance small and medium-sized firms at the prototype level would be required. Assisting private sector in bearing the risk of returns and providing consistent orders would be need of the hour.

(q) **15% Budget for Private Defence Industry (Asia, 2021)^{xxii}.** In a historic decision, 15 percent of MoD's capital procurement budget for year 2021-22 has been set aside for direct procurement from the private defence industry. This decision is a big boost for Indian defence companies and will benefit India's defence industry ecosystem, including MSMEs and startups.

This is the first time that a goal like this has been set. Under the Atma Nirbhar Bharat campaign, this major decision aims to promote India's defence industry ecosystem. The earmarking of 15% of the capital procurement budget for private industry will be in addition to procurements from private defence sector by Defence PSUs and the Ordnance Factory Board (OFB) as part of their requirements.

(r) Long term Strategy. Presently there does not exist a long term comprehensive strategically directed approach to achieve self reliance in the Defence sector. Thus the need of the hour is to have long-range, time bound and including few ingredients for obtaining high end technology through the acquisition route. Some of the ingredients that need to be included are:-

(i) Suitable interface between defence R&D and academic activities.

(ii) Encouragement and absorption in DRDO by sponsoring students in IITs and other institutions.

(iii) Provide funding and other facilities to independent think tanks.

(iv) In the "Buy" and "Buy & Make" categories make policy changes to involve the private sector in the categorisation process.

(v) By taking advantage of availability of raw material and relatively low cost of labour locally with inputs of high technology from foreign collaborator there is a need to make changes in policy to allow establishment of JVs with foreign firms in India to manufacture and export weapons and equipment at competitive prices.

6.3 Recommendations for Service HQ

(a) **SQR Formulation.** An SQR (Services Qualitative Requirements) is the basic building block on which the complete edifice of the acquisition is based. The entire acquisition process is directed towards acquiring the capability, which satisfies the laid down SQRs and its formulation is a very stringent and specialised process, which requires detailed professional competence and high level of domain knowledge and practical experience. Thus the service HQ needs to ensure that the SQRs so formulated are achievable and after their finalization these should not be amended.

(b) **Projection of Feasible and Realistic Requirements by Armed Forces.** The armed forces must sit down and create a 10-year Integrated Capability Development Plan (ICDP) and a 5-year Defence Capital Acquisition Plan (DCAP) that is reasonable, realistic, and really integrated. Furthermore, the armed forces must project requirements of weapon system and equipment that are practicable and realistic.

(c) **Redefining Transfer of Technology.** Modern military systems are intricate, relying on a variety of proprietary technologies. The infusing of technology takes a long time in the development, fabrication, and induction of these systems. This complicates ToT for military in comparison to other technologies. ToT has been a part of Indian industry's collaboration with international partners.

(d) **Participation of the private sector in maintenance assistance.** Almost all defence acquisitions include long-term maintenance support and,

as a result, infrastructure development. This activity, post initial induction of support hardware from the OEM, is almost completely undertaken by the Armed Forces themselves.

(e) **Training.** Officers in charge of acquisition should be trained in project and procurement management so that they can act as true acquisition managers. The tenure of these officers and personnel should be much more than that is given to others.

6.4 Recommendations for success of Make-in-India

The Make in India initiative, launched by the Modi government, has no doubt provided a fresh lease of life to India's moribund defence industry. Under the ambit of Make in India, the government has undertaken several reforms and other 'ease of doing' business measures. Most of these measures are confined to the private sector. The succeeding paragraphs lists out the key issues and reforms that the government need to pursue in a time-bound manner, to give a fillip to this vital sector and make the Make in India initiative a truly transformational slogan:-

(a) **Establishment of a Make in India Council within MoD.** The government has established the Defence Acquisition Council (DAC) under which there are two boards namely Defence Production Board and Defence R&D Boards. The government may like to convert the DAC into a Make in India Council.

(b) **Appoint an Additional Secretary for Private Sector within DDP**
The private sector's dissatisfaction was heightened even in the Make in India environment, when the MoD, in violation of its own commitment, awarded

two large projects worth Rs 40,000 crore to public sector shipyards. The private sector has recently advocated a transfer of administrative authority for the whole defence industry to the Prime Minister's Office, which is regarded as successful in handling the space and nuclear energy industries. The DDP, among other things, needs to have dedicated officers in charge of the private sector led by an additional secretary.

(c) **OFs (Now corporations) and DPSUs should be reformed.** With Make in India emphasising the private sector's participation and competition in the tendering process, DPSUs and OFs (now transformed to Corporations) will be forced to dramatically enhance their operations in order to remain relevant. In addition to corporatization, some factories that have lost relevance due to high overhead costs and the availability of efficient and alternative capacity in the private sector should be closed or handed over to the private sector on a public-private partnership basis, which will have readily available infrastructure and skilled human resources to jumpstart its defence production.

6.5 **Recommendations for boosting Private Industry**

There is a need to evolve a *Defence Industrial strategy* by reviewing the DPP and the Defence Production Policy to incentivize the private industry partnership in Defence R&D and Production through improved policies. For private sector participation in defence production the following are recommended:-

(a) A National Defense Production Policy should be in place in India. A competent authority should be established to keep track of the progress of designated products.

- (b) Direct imports from other countries should be restricted. Rather than nomination, suppliers should be chosen based on competitive criteria.
- (c) Encourage healthy competition between the private and governmental sectors to produce defence equipment using cutting-edge technologies at a reasonable cost. In terms of international suppliers, a level playing field should be maintained for both public and private sector industries.
- (d) Acquisition should be based on product strategy. Users should be involved during the entire development process. Overseas bidders should be considered only if they have tie up with suitable Indian partner.
- (e) A National Offset Policy should be implemented. During the categorization of things under "Buy," "Buy and Make," or "Make," Indian industry (both public and private) should participate on level field.
- (f) Participation of the private sector in defence R&D should be aggressively encouraged and, when possible, funded by the government.
- (g) Price advantage should be given to domestic producers as against the overseas competitors.
- (h) Collaboration with the greatest design and production houses is required. In this exercise, the government must offer OEMs and Design Houses the freedom to choose their partner, rather than being forced to choose a PSU or an Ordnance Factory (now corporation).
- (i) Provide infrastructure status to investment by the private sector as has been given recently to the shipbuilding and ship-repair industry.

- (j) Provide price preference to the domestic manufacturers vis-à-vis foreign companies.
- (k) Extend the LC-based payment system to the private companies, as is given to the foreign companies. Abolish nomination approach of awarding contracts to DPSUs and OFs.
- (l) Involve the Industry in the formulation of Qualitative Requirements (QRs) which form the basis for procurement and are often prepared by aggregating the best of the features taken from the equipment available in the world market.
- (m) Assured Orders and long term partnership with selected private industries. Inclusion of the Private Industry Associations / Representatives in categorization of proposals

6.6 Recommendations for R&D

As DRDO conducts most of R&D and because industry and other agencies conduct very little R&D, the DRDO has become synonymous with India's defence R&D. Despite some areas of excellence (particularly in nuclear and missiles), the organisation has struggled to provide a wide spectrum of equipment to the armed forces. In this context, the following particular recommendations are made:-

- (a) Increase DRDO's share in the defence budget to 10 per cent. Allocate at least 10 per cent of DRDO's budget (i.e. one per cent of overall defence budget) for promoting R&D on the lines of DARPA of the US or OCS of Israel.
- (b) Set up a defence technology-specific university to cater for long-term specialised human resources requirements of DRDO.

- (c) Create a mechanism for increased number of higher appointment of senior armed forces officials in DRDO.
- (d) Institute third-party review system for each of the major DRDO projects to ensure greater accountability.

6.7 Recommendations for Acquisition Model

Defense capital procurement is a lengthy, complicated, and time-consuming process that necessitates competence in "technology, military, finance, quality assurance, market research, contract management, project management, administration, and policy formulation." There are no easy answers to India's several simultaneous issues in the defence acquisitions process, especially given the varying goals of numerous stakeholders. Instead, it will necessitate numerous steps, all of which will invariably be to the prejudice of certain stakeholders. In this context, methods in the succeeding paragraphs are suggested.

G2G Procurements. G2G ^{xxiii} buying of defence equipment allows countries to use (Behra, Kaushal, 2013) the sale to further their foreign policy objectives. Increased defence cooperation, combined with incremental expansion in defence hardware acquisition through G2G arrangements, requires policy formation as soon as possible. High-tech, sensitive, and dangerous defence gear from foreign countries is only available through G2G agreements, and our procurement system should specifically cater to these requirements.

Strategic Partnership. The Govt (GoI , MoD, 2020) had notified the strategic partnership policy ^{xxiv} to engage the Indian private sector in manufacture of hi-tech defence equipment in India. This policy is an integral step towards indigenization,

capability development and will lead to PPP. Achieving self-reliance and self-sufficiency calls for assimilation of technology, extensive indigenization and developing an ecosystem. This will require the private sector partner selected through a laid down procedure by the government to make necessary long term investments in manufacturing infrastructure, an eco-system of suppliers, skilled human resources, R&D for modernization and upgrades as well as and other capabilities, besides production of equipment. The overall aim will be to progressively build indigenous capabilities in the private sector to design, develop and manufacture complex weapon systems for the future needs of the Armed Forces. This will be an important step towards meeting broader national objectives, encouraging self-reliance and aligning the defence sector with the 'Make in India' initiative of the Govt.

Strategic Partnership Model

The SPM as and when implemented will enable participation of private Indian firms in defence. The SP is expected to play the role of a System Integrator by building an extensive eco-system comprising development partners, specialised vendors and suppliers, in particular, those from the MSME sector.

The selection criteria for SP will be based on the inherent capacity and ability of the vendor to emerge as a systems integrator and to set up a vendor network for sourcing. Potential SPs will be identified primarily based on their experience and competence in integration of multi-disciplinary functional system of systems, engineering and manufacturing. SP will need to enter into relevant tie-ups with foreign OEM. Final selection of SPs will be guided by the price quoted by the potential SPs. In the initial phase, strategic partners will be selected in the following segments:-

- (a) Fighter Aircraft.
- (b) Helicopters.
- (c) Submarines.
- (d) Armoured fighting vehicles (AFV)/Main Battle Tanks (MBT)

To ensure that larger number of companies participate in the process of defence manufacturing in the private sector, and the SP maintains focus on a core area of expertise, only one SP will generally be selected per segment. As the SPM is designed to build indigenous manufacturing capacity in major defence platforms, the Applicant Company and subsequently the SP when appointed should be an Indian company, owned and controlled by resident Indian citizens.

Role of OEM

To manufacture major defence platforms, SP will require tie-ups with foreign OEM, to cover manufacturing, ToT, assistance in training skilled human resources and other support. Such partnerships or tie-ups between SP and OEM may take the form of joint ventures (JV), equity partnerships, technology-sharing, royalty or any other mutually acceptable arrangement between the companies concerned.

OEM will be jointly responsible along with SP for certification and quality assurance of platforms supplied to MoD. To facilitate selection of OEMs, MoD need to implement a process of shortlisting of OEMs for each segment simultaneously with the process of identifying SPs. This shortlisting of eligible OEMs will be through an Expression of Interest. Shortlisted OEMs will provide an undertaking confirming their willingness to cooperate with the SP to manufacture the platform in India, including handholding, ToT and confirm life-cycle support.

6.8 Conclusion

Partnerships, joint ventures, cluster operations, and other commercial models are all part of the defence production ecosystem. Integration of decision-makers, universities, think tanks, and state-owned research centres with the defence industry is the need of hour. It entails creating a dedicated environment for defence production, vendor development, and private-sector supply chain integration.

Furthermore, it is believed that the development of the domestic manufacturing industry is critical for achieving defence sector self-reliance as well as strategic autonomy for country. The armed forces, as the ultimate users and significant stakeholders, are required to participate actively in defence acquisition process. The Indian private sector has already demonstrated its competence in the fields of automobiles, IT and service sectors at the global level, however, the same is required to be replicated in the defence sector. In view of aforesaid, it is recommended that necessary actions must be taken to ensure that India develops the required capacity and capability to become self-reliant in defence acquisition / manufacturing, which would lead to greater strategic autonomy and economic development.

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Refers to Para 3.10 (e)
of Chapter III

Appendix A: Details of Joint Ventures of Pvt Inds with OEMs

MAJOR PRIVATE INDUSTRIES IN JV / SP /MoU WITH FOREIGN OEMs

(Source:http://www.nishithdesai.com/fileadmin/user_upload/pdfs/Research_Papers/Primer_on_the_Indian_Defence_Industry.pdf)

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Source : KPMG and CII, “ Opportunities in the Indian Defence sector : An Overview”)

Indian JV/ Tie Up Partner	Foreign OEM as JV/Tie Up Partner	Type of Systems
Bharat Forge Ltd	Rafael Advanced Def System	Missile Technology, Remote Weapon Systems and Advanced Armour Solutions including ICV BMP-II Upgrade and Tactical Control System
	Elbiet System,	Most Advanced Artillery and Mortars Systems Solutions.
	Rolls-Royce Corp	Supply of Aero engine parts
Tata Group Tata Advanced Systems	Boeing Co ,USA	Jointly developing products and platforms in aerospace and defence manufacturing
	Lockheed Martin Corp, USA	Manufacturing aero structure of Chinook CH 47 and AH 61 s in India; Manufacturing including export of new generation fighteraircraft F-16
	Bell Helicopters Ltd	Naval Utility Helicopters
	Sikorsky Aircraft Corp	Indigenous manufacturing of helicopters including for the Navy
	Boeing	Formed a JV for USD 500 Mn to manufacture military components for the F-18 Super Hornet fighter, the CH-47 Chinook helicopters and the P-8 Maritime patrol aircraft.

	Israel Aerspace Industries Limited	To develop and manufacture missiles, Remotely Piloted Aircraft (RPA), radars, electronic warfare systems and homeland security systems.
	Sikorsky Aircraft Corporation, Lockheed Martin Company	Has two divisions already set up in Hyderabad. One has assembly of rotor systems of Sikorsky helicopter, while the second division assembles the entire tail plane section of the C-130 Super Hercules transport aircraft.
Reliance Group Reliance Defence/ Reliance Aerostructures	Thales French company,	Underwater Systems
	Ukraine-based Antonov	Transport aircrafts
	Israel's Rafael	Air-to-Air Missiles
	Yugoimport Serbia's state-run defence major	To manufacture ammunition in India.
	Dassault Aviation (France)	Manufacturing unit in India for Dassault Aviation's supply and offset contract partner (IOP) for 1 22000 crore fighter jet deal signed with France
	LIG Nex1(South Korea)	Air defence, surveillance radar, sensors and missiles.
	Kalashnikov Israel Company	Manufacture Kalashnikov class of weapons for Indian armed forces
	DCNS France	Landing Platform Docks
Mahindra Defence Systems	Airbus Helicopters of Europe	To make military helicopters
	UK's Ultra Electronics	To build equipment for under water warfare Technologically Advanced Radios for Indian Army
	Airbus Helicopters	To produce military helicopters in India
	British Aerospace Systems	Formed JV in order to assist in the manufacture of land combat vehicles based on BAE's successful RG-31 mine protected vehicles.

Larsen & Toubro	Navantia, Spain	Landing Platform Docks
	MBDA Missile Systems Ltd, France	To develop and supply missiles and missile systems to Indian armed forces
	Hanwha Techwin, Korea	To supply self-propelled guns to the army
	Nexter Systems, France	Mounted gun systems (MGS) Artillery programme of the Indian army
	EADS Defence and Security of Europe	Development, design, manufacturing and related services in the fields of electronic warfare, radars, military avionics and mobile systems.
	Dassault Aviation, RAC-MIG, SAAB Gripen, Lockheed Martin Company	Could take part in certain aircraft manufacturing processes post contract finalization of the Multi Role Combat Aircraft (MRCA). Offset for the contract would relate to areas of manufacturing or sub-systems, for which for which there would need to be detailed project definition
Hindustan Aeronautics Ltd (HAL)	Samtel Avionics Pvt Ltd	SU-30 Mk I Multi Function Display (MFD) to HAL
	M/S Alphonatocol PvtLtd	To supply major structural assemblies of SU-30 fighter aircraft such as Flaperon, Rear Door, Front Door, Airbrake, Cartridge Box, Wing Tip to HAL
Bharat Electronics Ltd (BEL)	HAL	Cockpit Modules, Flight Control and Weapon Control Systems for LCA Mk I and Mk II.
	Thales France	Multi Target Tracking Radar
	Thales and Dassault	AESA radar and EW Suite will be manufactured by BEL under co-production agreement
	General Electric Pvt	Medical equipment manufactured

	Ltd	by the joint venture GE-BE Pvt Ltd
	M/S Rolta Pvt Ltd	A Special Purpose Vehicle to develop BMS (Battlefield Management System)
Ashok Leyland Defence Systems Ltd (ALDS)	Krauss-Maffei Wegmann (KMW) GmbH and Co. KG, Germany	To cooperate in developing advanced defence systems such as artillery, armoured wheel vehicles and bridge laying systems for Indian defence establishments
	Paramount Group, South Africa	For the development and manufacture of Mine Protected Vehicles in India
	Lockheed Martin	Combat vehicles for the Indian Army. The base platforms of Lockheed combat vehicles will be used to develop light specialist and light armoured multi-purpose vehicles for the Indian Army.
Dynamatic Technology Ltd	IAI Israel	Jointly handle production/ assembly of UAVs support to miniUAV.
Kalyani Strategic Systems Ltd	IAI Israel	JV would build and market Air defence systems and ground to ground / ground to sea munitions.
Defsys (Defence Solution Pvt Ltd)	Controp Precision Technologies Ltd (Controp Israel)	Production of Electro-optical (E/O) systems utilized for day-night surveillance in mini UAVs, electro-optical payloads on naval platforms and E/O pods for helicopters and light aircrafts.
Hindustan Computers Limited (HCL)	Boeing	Entered into an agreement with Boeing and Indian Institute of Science, Bangalore (IISc) to develop wireless and other network technologies for aerospace related applications.
	Circor Aerospace Inc	Announced a strategic partnership to design and develop software for fluid controls, landing gear for aerospace and defence applications.
National Skill Development Centre and Ministry of Industry, IT and Commerce Telangana	Airbus, Aerocampus France	A “Centre of Excellence” aimed towards enhancing the skill and employability of local youth. Also collaborate with global aerospace majors in support of “Make in India” initiative

Appendix B: PPP Models adopted by Various Countries

GLOBAL PPP INITIATIVES: AN OVERVIEW

The Defence production establishments all over the world are undergoing an overhaul. Nations have begun to focus on revamping the system and its functioning to make it slimmer, sleeker, more streamlined and accurate, minimising wastage of resources. The main aim of all these reforms is to ensure availability of the latest, most reliable equipment to the Armed Forces of the nation, in a cost and time effective manner. Public-Private Partnerships (PPPs) in defense have gained momentum in various countries around the world over the past decade. It is time to analyse as to how defense PPPs has evolved around the world since their inception in the UK in the 1990s. The objective is to first determine whether there are any key common denominators that steer the countries toward the adoption of PPPs to meet their defense needs.

United Kingdom

Strategic Defence Review was conducted in 1998 for the UK Defence, was towards Public Private Partnership in defence, to best address the problems of declining funds and increasing competition from the civil sector faced by its premier technology evaluation and consolidation organisation: Defence Evaluation and Research Agency (DERA). As a part of the Smart Procurement Process to streamline the Defence procurement and acquisition, relations were established and strengthened with the civil industry by two main approaches, to facilitate benefit sharing.

- (a) **Incentivisation:** The companies were given bonuses for value addition beyond the contractual requirements, in terms of time, cost efficiency and additional technical superiority. More freedom and flexibility were granted in terms of usage of the interim payments arrangements by which any retention against the contract price is adjusted to reflect good or poor performance. There also existed negative incentives for underperformance in terms of sanctions.
- (b) **Gain Sharing:** Gain share is where the reopening and examining of

existing contracts may bring benefit to both the MoD and industry. Benefits of gain share opportunities can include accelerated delivery of the product or service, performance improvements and reduced costs - in other words faster, better, cheaper. Technology advances, changes to trials programs, innovative support arrangements are examples of gain share that may develop while a contract is in action. The United Kingdom follows an interesting Public Private Partnership model. It employs tools such as Private Finance Initiatives (PFI) and Partnering to foster these relationships. A brief synopsis of one such strategy is given below.

According to the UK Ministry of Defence Policy Paper No 4 on Defence Acquisitions: “Wherever the MoD needs substantial new capital investment, it considers whether or not it makes sense for that investment to come from the private sector rather than from public funds. If so, the Department next considers whether such an approach has the potential to offer better value for money than if it bought assets directly. PFI aims to achieve this by allowing the MoD to focus on its core military tasks supported by a private sector partner, who can offer services more efficiently or at less cost because it is able to do things that cannot be done by MoD. Payments are made only on the satisfactory completion of the project; the incentive to deliver the project becomes stronger.

South Korea

South Korea’s Defence R&D is industry driven, it aimed at developing new weapon systems. The Government effectively focussed on the Development of Core technology and certain parts of strategic weapons. The three Industrial ‘Champions’ or companies primarily do the Defence Production in South Korea which are Hyundai, Samsung and Daewoo along with a number of their subsidiaries. These three majors form the backbone of the Defence Production in South Korea and are Private sector companies

USA

The National Defence Industrial Association (NDIA) is a leading defence industry association which promotes national security. The NDIA also provides a legal and

ethical framework for exchange of information between the industry and the US govt. The Pentagon and the private companies in the US defence market are assisted by smaller companies that play a major role in the supply chain. The Pentagon headquarters of the US DoD accounts for 40% of the global military sales which means that balance is done by the private sector. Huge private sector participation by the defence industry indicates strong and seamless interaction between the government and the industry. This is also true in case of Defence Acquisition.

France

In contrast to US model, the French model is based on combination of the “Public-Private” model. France has a powerful defence industry in a European perspective, which for many years has been the main supplier to the French Armed Forces. Main responsibility for French military procurement lies with Delegation Generale d'Armement (DGA) which is responsible for all French armament programs. It controls R&D, and production. It also does its own R&D for all military services and monitors the activities of both nationalized and private firms. DGA officials believe that in the state dominated defence field, administrative controls on quality and cost are superior to relying on market mechanisms such as competition. A drawback of French procurement system is that decisions tend to be made in a secretive, top-down manner with limited accountability to parliament or public.

The goal of national autonomy in defence procurement has resulted in acquisition of nearly all French weapons from domestic sources or JVs involving French companies, even when superior or less expensive alternatives were available from abroad. Positive aspects of French model which can be imbibed in Indian industry are as under:-

- (a) **Diversification of Defence Industry.** Post 1990, there has been a gradual shift in the French defence industry and diversification has taken place. The French Government strongly supports the defence sector and encourages private participation.
- (b) **Strong Checks and Balances by the DGA.** The DGA acts as a professional acquisition corps, provides adequate checks and balances between

Government and industrial power, accountability to the legislature and the public.

(c) **Synergy between Private and Public Sector.** DGA still remains the vital link between the Private and Public sector and ensures that national aims, defence requirements and timelines are adhered by the private players.

(d) **Reliance and Promotion of Dual Use Technology.** France has been successful in diversifying its defence industry into commercial markets, promoting the integration of civil and military production by eschewing regulatory barriers and placing greater reliance on dual-use technologies.

(e) The French model has also been successful in pursuing diversified strategic alliances and other forms of international collaboration in defence R&D and procurement.

Israel

The Israel's defence production model is similar to the US model and also receives tremendous technological support. Today "Israel has 150 defence firms with a combined revenue of approximately \$3.5 billion". The Israel Government's Procurement and Production Directorate (PPD) handles procurement and oversees the manufacture of systems and products, maintenance services for the military and civil defence systems. It essentially follows a public - private model which has the following advantages:-

High Foreign Investment in Defence Sector. The Israel Government promotes and facilitates a very high degree of foreign investment in defence production. This provides greater availability of new technology and faster development of systems.

Strict Government Control. The Israel Government ensures a strict governmental control on the defence production sector which helps in proliferation.

Spill Over of R&D Activities into Civil Industry. The technology

development by the Government owned R&D activities in Israel had a spill-over or spin-off effect in the non-military sector, spurring the technological advancement of sophisticated industry.

Foreign Military Sales. Israel Government allows foreign military sales and its profit is used for further R&D as well as to reduce cost for own defence procurement.

Russia

The defence industry of Russia is a strategically important sector and a large employer in the country. It is also a significant player in the global arms market. As the country has moved to a market economy and privatised much of its economic potential, the managers of the enterprises have found it necessary to convert most of their output to non-military products and services as well as to restructure the enterprises. The Russian model of defence production is based upon the public sector wherein Govt factories produce defence equipment with technical support from the Govt research agencies. The key issues to be imbibed from the Russian model are as under:-

Importance of Efficiency of State Owned R&D Agencies. The Russian model of public defence production has been successful largely due to the ability of the state owned research agencies to develop new and innovative technology.

Export Oriented Industry to Lower the Cost of Production. The Russian defence production agencies focus on export of weapons and equipment to friendly foreign countries under the control of the Russian Govt. This provides the much needed funds for carrying out the R&D as well as to sustain the industry in case of reduced Govt funding.

South Africa

Under a major restructuring that began in April 1992, a segment of Armaments Corporation (ARMSCOR) and several of its manufacturing subsidiaries were reorganized as an independent weapons manufacturing company, "Denel". Denel and

several other manufacturers produced equipment on contract with ARMSCOR, which retained overall responsibility for military acquisitions. ARMSCOR also acted as the agent of the state, regulating military imports and exports, issuing marketing certificates and ensuring adherence to international agreements. The South African Govt owned Armaments Corporation of South Africa Limited is the officially appointed acquisition organisation for the SA Department of Defence. It also renders a professional acquisition service to other government departments and public entities. The key take away from the South African model are as under:-

Identification of Core Products. In 1994, after a serious crisis in South African defence Industry, core products like the G-8 artillery systems and vehicles were identified and others such as shipbuilding were discontinued.

Focus on Second Tier Industries. South African defence industry shifted its focus from high technology items to second tier products which were more easy and profitable to produce.

International Collaborations. Another remarkable aspect is the tie up of South African defence industries with leading defence product manufacturing giants of the world which has provided access to latest technology.

Investments in Dual Use Technology and Strategic Foreign Industries. South Africa also invested in strategic foreign industries, recruited foreign technicians to design, develop and manufacture weapons. It also rented and leased technical services including computers and resorted to cover deceptive practices, outright smuggling and piracy to meet its defence needs.

China

Although there is no comparison with the policy followed in China to encourage indigenisation in defence production, it still gives a fair idea of the importance given by the Chinese Govt to indigenous production. China could not afford to depend upon foreign countries for critical technologies. In barely a decade, People's Liberation Army (PLA) has transformed into a top-rung, largely indigenously equipped force. China took the following steps to do it:-

(a) China did it by violating all the intellectual property rights rules. That included stealing, reverse engineering and cloning. It recruited a large number of out of work scientists from the former Soviet Union.

(b) Earlier the Chinese defence industry was organized in the Soviet style. R&D were separate from the manufacturing units. The products were developed by R&D and then were given to the production agency. But when the factory got the blueprints, there was confusion because they had not been involved in the design. Neither the R&D nor the industry had any stake in the weapon production or innovation. China changed the approach by letting military and acquisition committee play central role. The logic was that the user must have a say in the development of the equipment. As end user the military took interest in innovativeness and timely performance.

It is evident from the above that the Chinese indigenisation plan had the approval from the highest level of political and military leadership.

Defence Industries - Global Scenario

However, there exists some hurdles to be bridged due to the regulatory systems of different countries participating in the Indian defence industry. The USA Department of Defence (DoD) has Foreign Military Sales (FMS) and Direct Commercial Sales (DCS). While FMS would need the US Congressional Senate Committee approval, the DCA would need India to deal with the US industry directly. However, it needs a mention here that all defence related contracts must require US Govt approval.

The USA has Defence Advanced Research Projects Agency (DARPA) which functions on similar lines as our DRDO and functions under the US DoD. Due to the enhanced and superior capabilities of US private sector US DoD has relied on the private industry in contribution to the Defence sector. However, the ordinance of US Government does not permit the US private industry to directly sell any defence related product or equipment to a foreign country without the approval of the US Congressional Senate Committee. The above analysis and the lessons that can be derived out of the successful defence production models of selected countries can be suitably modified to suit the Indian defence industry needs.

Refers to Para 4.3
of Chapter IV

Appendix C: Major Projects undertaken with Private Sector Participation¹

Indian industry, both public and private, has collaborated successfully and proved its ability to deliver the desired results. Some of the notable projects undertaken for defence are briefly discussed as under:-

Akash (Air Defence System). The Akash Surface-to-Air Missile (SAM) system, a part of the Integrated Guided Missile Development Programme (IGMDP) was produced by Bharat Electronics (BEL). Bharat Dynamics (BDL) served as the nodal agency for the Akash SAMs' production for the Army. Launcher systems were provided by Tata Power and Larsen & Toubro. The equipment has been successfully inducted in the IAF and Indian Army. Akash is the outcome of a successful partnership between the Defence Research and Development Laboratory (DRDL), the nodal lab in DRDO, along with 13 other DRDO labs, 19 Public Sector Units, 5 OFs, 3 national laboratories, 6 academic institutions and more than 265 private industries across the country.

Missile Development Programme. India's missile development programme is completely indigenous. Under the leadership of Dr APJ Abdul Kalam, then Director, DRDL, the indigenous development of a series of missiles was progressed by the DRDO. The Integrated Missile Development Programme (IGMDP) included five missiles viz. the Agni, Prithvi, Akash, Trishul and Nag. The project was accorded approval by the GoI on July 26, 1983, and was completed in March 2014. The ambitious time-bound project brought together the scientific community, academic institutions, R&D laboratories, industries and the armed forces in giving shape to the strategic missile development programme.

¹ Chander, S. (2019a). *PPP & the road to self reliance in Defence : A perspective*. <https://ojs.indrastra.com/index.php/clawsjournal/article/view/91/99>. Retrieved on February 10, 2022

Light Combat Aircraft (LCA) Tejas. The LCA was designed and developed by the Aeronautical Development Agency (ADA) with HAL as the principal partner, along with DRDO, Council for Scientific and Industrial Research (CSIR), BEL, Directorate General of Aeronautical Quality Assurance (DG AQA), IAF and Indian Navy (IN). Thirty three R&D establishments, 60 major industries and 11 academic institutions participated in the project. On January 17, 2015, the IAF got its first indigenously built LCA Tejas, Series Production-1 (SP1), which was handed over by the then Defence Minister, late Mr Manohar Parrikar, to the IAF in Bengaluru.

Samyukta (Early Warning System). The Samyukta, a mobile integrated electronic warfare system, was jointly developed by the DRDO, DRDL, Instrument Research & Development Establishment (IRDE), Electronics & Radar Development Establishment (LRDE), BEL, Electronics Corporation of India Limited (ECIL), Tata Power SED and the Corps of Signals of the Indian Army. It was delivered to the Indian Army in 2004.

Rohini / Revati Radar. One of the examples of successful collaboration of DRDO, DPSU (BEL) and the Private Sector (L&T) is development of Rohini and Revati Radar system. For this project L&T had developed the mast and energy system, whereas the design and data analysis centre was implemented by DRDO and BEL respectively.

Design	-	DRDO
Mast & Energy System	-	L & T
Data Analysis Center	-	BEL

Dhanush System. Dhanush system is an exclusive example, where the user (Indian Navy) had interacted closely and provided valuable inputs for the successful development of the system according to their need. Dhanush system has been jointly developed by L&T (system provider) and DRDO (design supplier).

L & T	-	Entire on-board system including stabilisation and Weapon control systems
DRDO	-	Weapon and subsidiary systems Command and Control Satellite linkages
NAVY	-	Modifications in Ships Architecture

Refers to Para 2.5 of
Chapter II
Refers to Para 2.5
of Chapter II

Appendix D: Questionnaire

Please fill in the following details and thereafter proceed to answer the questions

Rank & Name (Optional) :

Experience/Service (Please select any one option below)

Less than 20 Years :

20 Years or More :

Service/ Department/Profession (Please select any one option below)

Army / Navy / Air Force	
R&D Organisation	
Defence PSUs	
IAS/Allied Services	
Others, please specify	

SA – STRONGLY AGREE, A – AGREE, N- NEUTRAL, D- DISAGREE, SD- STRONGLY DISAGREE						
SL NO	QUESTION	SA	A	N	D	SD
1	Keeping in view the security scenario, Indian Defence sector needs to become self-reliant					
2	Public Private Partnership (PPP) model has been implemented and has worked satisfactorily for development of highways, railways, airports, power etc. It is time that PPP model should be implemented for acquisition of Defence equipment					
3	Defence PSUs are not performing at the pace and level as required by the Armed Forces					
4	Through PPP model, India will be able to develop its industrial base for Defence equipment					
5	Integration of Public and Private sector would enhance the acquisition of Defence equipment					
6	Increase of FDI limit to 74% would lead to faster acquisition of defence equipment					

7	Involvement of private sector is necessary in order to enhance the acquisition of defence equipment					
8	PPP in defence manufacturing is likely to capitalise on strengths of both public as well as private sectors while mitigating the risks on account of their individual weaknesses?					
9	Adoption of PPP model will enhance efficiency of defence manufacturing sector and make it more competitive					
7	Public sector will be able to meet the requirement of Defence forces single handedly					
8	Private sector will be able to meet the requirement of Defence forces single handedly					
9	At present, there is a trust-deficit between public and private sector involved in defence manufacturing?					
10	Adoption of effective PPP models and concepts like Make in India, Atmanirbhar Bharat etc are likely to take India forward towards realising the goal of self - reliance?					
11	PPP will enhance the potential of SMEs.					
12	A number of committees were set up to give out recommendations for self-reliance in defence production by effective PPP. There is an emergent need to implement their recommendations in time bound manner.					

Any other solution / suggestions for implementing PPP model for acquisition of Defence equipment

End Notes

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